|                        | CRF Err             | rors Corrected b                          | by the STIC Sy         | stems Branch                                   | 10/22/             |
|------------------------|---------------------|---|------------------------|--|--------------------|
| umber:_                | 923,0               | 692c                                      | _                      | CRF Processing Edited by:                      | Date: / - / 20/ (  |
| Changed                | a file from non-AS  | CII to ASCII                              |                        | Verified by:                                   | (STIC              |
| Changed                | he margins in cas   | ses where the seque                       | ence text was "wrap    | oped" down to the ne                           | EMTE               |
| Edited a fo            | ormat error in the  | Current Application                       | Data section, spec     | ifically:                                      |                    |
| Edited the applicant v | Current Application | on Data section with application data; or | the actual current     | number. The numb                               | er inputted by the |
| Added the              | mandatory head      | ling and subheading                       | s for "Current Appl    | lication Data".                                |                    |
| Edited the             | "Number of Sequ     | uences" field. The a                      | pplicant spelled ou    | t a number instead o                           | of using an intege |
| Changed t              | he spelling of a m  | nandatory field (the h                    | neadings or subhea     | adings), specifically:                         |                    |
| Inserted a             | space between th    | ne last nucleic desig                     | nator and the nucl     | eic number for seque                           | ences:             |
| Deleted pa             | ige numbers in the  | e text of the sequen                      | ce listing, which is   | considered invalid te                          | ext.               |
| Corrected              | the SEQ ID NO w     | hen obviously incor                       | rect. The sequenc      | e numbers that were                            | e edited were:     |
| Inserted a             | nucleic number at   | t the end of a nuclei                     | c line. SEQ ID NO      | O's edited:                                    |                    |
|                        |                     |   |                        | ame line as each su<br>ed to its appropriate p |                    |
| Inserted o             | olons after headir  | ngs/subheadings. H                        | leadings edited inc    | luded:   |                    |
| Deleted e              | xtra, invalid, head | lings used by an app                      | olicant, specifically  | :  |                    |
| Deleted r              | on-ASCII "garbaç    | ge" at the end of file:                   | s, and other invalic   | i text, such as a seci                         | retary's initials. |
| Inserted               | nandatory headin    | igs, specifically:                        |                        |  |                    |
| Corrected              | l an obvious error  | r in the response, sp                     | ecifically:            | imber Zei                                      | ro Cp.             |
|                        |                     | pper case is used but                     |                        |  | ,                  |
| Corrected              | an error in the N   | lumber of Sequence                        | es field, specifically |  |                    |
| A "Hard !              | Page Break" code    |   |                        |  | deleted            |

\*Examiner: The above corrections must be communicated to the applicant in the first Office Action. DO NOT send a copy of this form.

8/01/93

### RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:28:02

|   | . 1                               |       | SEQUENCE LISTING   |   |
|---|-----------------------------------|-------|--|---|
|   | 3<br>4                            | (1)   | General Information:   | Γ |
|   | 5<br>6<br>7<br>8<br>9<br>10<br>11 | (i)   | APPLICANT: Donson, Jon Dawson, William 0. Grantham, George L. Turpen, Thomas H. Turpen, Ann Myers Garger, Stephen J. Grill, Laurence K.  |   |
|   | 13<br>14                          | (ii)  | TITLE OF INVENTION: RECOMBINANT PLANT VIRAL NUCLEIC ACIDS  |   |
|   | 15<br>16                          | (iii) | NUMBER OF SEQUENCES: 11  |   |
|   | 17<br>18<br>19<br>20<br>21<br>22  | (iv)  | CORRESPONDENCE ADDRESS:  (A) ADDRESSEE: Limbach & Limbach  (B) STREET: 2001 Ferry Building  (C) CITY: San Francisco  (D) STATE: CAL  (F) ZIP: 94111                              |   |
|   | 23<br>24<br>25<br>26<br>27<br>28  | · (v) | COMPUTER READABLE FORM:  (A) MEDIUM TYPE: Floppy disk  (B) COMPUTER: IBM PC compatible  (C) OPERATING SYSTEM: PC-DOS/MS-DOS  (D) SOFTWARE: Patent in Release #1.0, Version #1.25 |   |
| > | 29<br>30<br><b>31</b><br>32<br>33 | (vi)  | CURRENT APPLICATION DATA:  (A) APPLICATION NUMBER: US 923,692  (B) FILING DATE: 31-JUL-1992  (C) CLASSIFICATION:   |   |
|   | 34<br>35<br>36<br>37              | (vii) | PRIOR APPLICATION DATA:  (A) APPLICATION NUMBER: US 600,244  (B) FILING DATE: 22-OCT-1990  |   |
|   | 38<br>39<br>40<br>41              | (vii) | PRIOR APPLICATION DATA: (A) APPLICATION NUMBER: US 641,617 (B) FILING DATE: 16-JAN-1991  |   |
|   | 42<br>43<br>44<br>45              | (vii) | PRIOR APPLICATION DATA:  (A) APPLICATION NUMBER: US 310,881  (B) FILING DATE: 17-FEB-1989  |   |
|   | 46<br>47<br>48<br>49              | (vii) | PRIOR APPLICATION DATA: (A) APPLICATION NUMBER: US 160,766 (B) FILING DATE: 26-FEB-1988  |   |
|   | 50<br>51                          | (vii) | PRIOR APPLICATION DATA: (A) APPLICATION NUMBER: US 160,771   |   |

### RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:28:05

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52
                (B) FILING DATE: 26-FEB-1988
 53
 54
      (vii)
                PRIOR APPLICATION DATA:
 55
                (A) APPLICATION NUMBER: US 347,637
 56
                (B)
                    FILING DATE: 05-MAY-1989
 57
 58
      (vii)
                PRIOR APPLICATION DATA:
 59
                (A) APPLICATION NUMBER: US 363,138
 60
                (B) FILING DATE: 08-JUN-1989
 61
 62
      (vii)
                PRIOR APPLICATION DATA:
 63
                (A) APPLICATION NUMBER: US 219,279
                (B) FILING DATE: 15-JUL-1988
 64
 65
                ATTORNEY/AGENT INFORMATION:
 66
      (viii)
 67
                (A) NAME: Halluin, Albert P.
                    REGISTRATION NUMBER: 28,957
 68
                (B)
                (C) REFERENCE/DOCKET NUMBER: BIOG-20121
 69
 70
     USA
 71
 72
       (ix)
                TELECOMMUNICATION INFORMATION:
                     TELEPHONE: 415-433-4150
 73
                (A)
 74
                (B)
                     TELEFAX: 415-433-8716
 75
 76
      (2) INFORMATION FOR SEQ ID NO: 1:
 77
 78
 79
        (i)
                SEQUENCE CHARACTERISTICS:
 80
                (A)
                    LENGTH: 4 amino acids
                (B)
                     TYPE: amino acid
 81
                (D)
                     TOPOLOGY: linear
 82
 83
 84
       (ii)
                MOLECULE TYPE: peptide
 85
 86
      (iii)
                HYPOTHETICAL: NO
 87
       (iv)
                ANTI-SENSE: NO
 88
 89
 90
       (xi)
                SEQUENCE DESCRIPTION: SEQ ID NO: 1:
 91
 92
           Pro Xaa Gly Pro
 93
           1
 94
 95
      (2) INFORMATION FOR SEQ ID NO: 2:
 96
 97
        (i)
                SEQUENCE CHARACTERISTICS:
 98
                (A) LENGTH: 13 base pairs
 99
                (B)
                     TYPE: nucleic acid
                (C) STRANDEDNESS: single
100
                (D) TOPOLOGY: linear
101
102
```

### RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:28:07

| 103 | (ii)                | MOLECULE TYPE: DNA (genomic)                              |     |
|-----|---------------------|---|-----|
| 104 |                     |   |     |
| 105 | (iii)               | HYPOTHETICAL: NO  |     |
| 106 |                     |   |     |
| 107 | (iv)                | ANTI-SENSE: NO  |     |
| 108 |                     |   |     |
| 109 | (xi)                | SEQUENCE DESCRIPTION: SEQ ID NO: 2:                       |     |
| 110 |                     |   |     |
| 111 | GGGTACC             | TTGG GCC  | 13  |
| 112 |                     |   |     |
| 113 |                     |   |     |
| 114 |                     |   |     |
| 115 | (2) IN              | FORMATION FOR SEQ ID NO: 3:                               |     |
| 116 |                     |   |     |
| 117 | (i)                 | SEQUENCE CHARACTERISTICS:                                 |     |
| 118 |                     | (A) LENGTH: 886 base pairs                                |     |
| 119 |                     | (B) TYPE: nucleic acid                                    |     |
| 120 |                     | (C) STRANDEDNESS: single                                  |     |
| 121 |                     | (D) TOPOLOGY: linear                                      |     |
| 122 |                     |   |     |
| 123 | (ii)                | MOLECULE TYPE: DNA (genomic)                              |     |
| 124 |                     |   |     |
| 125 | (iii)               | HYPOTHETICAL: NO  |     |
| 126 |                     |   |     |
| 127 | (iv)                | ANTI-SENSE: NO  |     |
| 128 |                     |   |     |
| 129 | (vi)                | ORIGINAL SOURCE:  |     |
| 130 |                     | (A) ORGANISM: Chinese cucumber                            |     |
| 131 |                     |   |     |
| 132 | (vii)               | IMMEDIATE SOURCE:   |     |
| 133 |                     | (B) CLONE: alpha-trichosanthin                            |     |
| 134 |                     |   |     |
| 135 | (ix)                | FEATURE:  |     |
| 136 |                     | (A) NAME/KEY: CDS (B) LOCATION: 8877                      |     |
| 137 |                     | (B) LOCATION: 8877  |     |
| 138 |                     | ·   |     |
| 139 | (xi)                | SEQUENCE DESCRIPTION: SEQ ID NO: 3:                       |     |
| 140 |                     |   |     |
| 141 | CTCGAGG             | ATG ATC AGA TTC TTA GTC CTC TCT TTG CTA ATT CTC ACC CTC   | 49  |
| 142 |                     |   |     |
| 143 |                     | Met Ile Arg Phe Leu Val Leu Ser Leu Leu Ile Leu Thr Leu   |     |
| 144 |                     | 1 5 10  |     |
| 145 |                     |   |     |
| 146 | TTC CTA             | ACA ACT CCT GCT GTG GAG GGC GAT GTT AGC TTC CGT TTA TCA   | 97  |
| 147 | <b>5</b> 1 <b>-</b> |   |     |
| 148 |                     | Thr Thr Pro Ala Val Glu Gly Asp Val Ser Phe Arg Leu Ser   |     |
| 149 | 15                  | 20 25 30  |     |
| 150 |                     | . ACA ACC ACM MCC MAM COA CMM MMC AMM MCA AAM CMC ACA AAA | 145 |
| 151 | GGT GCA             | A ACA AGC AGT TCC TAT GGA GTT TTC ATT TCA AAT CTG AGA AAA | 145 |
| 152 | Cl., 31-            | The Con Con Con Tun Clar Vol Dho Tlo Con Jon Lou Jun Tin  |     |
| 153 | сту Ата             | Thr Ser Ser Ser Tyr Gly Val Phe Ile Ser Asn Leu Arg Lys   |     |

# RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:28:10

| 154                      |            |            |            |            | 35         |            |            |            |            | 40         |            |            |            |            | 45         |            |     |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|
| 155<br>156               | GCT        | CTT        | CCA        | AAT        | GAA        | AGG        | AAA        | CTG        | TAC        | GAT        | ATC        | CCT        | CTG        | TTA        | CGT        | TCC        | 193 |
| 157<br>158<br>159<br>160 | Ala        | Leu        | Pro        | Asn<br>50  | Glu        | Arg        | Lys        | Leu        | Tyr<br>55  | Asp        | Ile        | Pro        | Leu        | Leu<br>60  | Arg        | Ser        |     |
| 161<br>162               | TCT        | CTT        | CCA        | GGT        | TCT        | CAA        | CGC        | TAC        | GCA        | TTG        | ATC        | CAT        | CTC        | ACA        | AAT        | TAC        | 241 |
| 163<br>164<br>165        | Ser        | Leu        | Pro<br>65  | Gly        | Ser        | Gln        | Arg        | Tyr<br>70  | Ala        | Leu        | Ile        | His        | Leu<br>75  | Thr        | Asn        | Tyr        |     |
| 166<br>167               | GCC        | GAT        | GAA        | ACC        | ATT        | TCA        | GTG        | GCC        | ATA        | GAC        | GTA        | ACG        | AAC        | GTC        | TAT        | ATT        | 289 |
| 168<br>169<br>170        | Ala        | Asp<br>80  | Glu        | Thr        | Ile        | Ser        | Val<br>85  | Ala        | Ile        | Asp        | Val        | Thr<br>90  | Asn        | Val        | Tyr        | Ile        |     |
| 171<br>172               | ATG        | GGA        | TAT        | CGC        | GCT        | GGC        | GAT        | ACA        | TCC        | TAT        | TTT        | TTC        | AAC        | GAG        | GCT        | TCT        | 337 |
| 173<br>174<br>175        | Met<br>95  | Gly        | Tyr        | Arg        | Ala        | Gly<br>100 | Asp        | Thr        | Ser        | Tyr        | Phe<br>105 | Phe        | Asn        | Glu        | Ala        | Ser<br>110 |     |
| 176<br>177               | GCA        | ACA        | GAA        | GCT        | GCA        | AAA        | TAT        | GTA        | TTC        | AAA        | GAC        | GCT        | ATG        | CGA        | AAA        | GTT        | 385 |
| 178<br>179<br>180        | Ala        | Thr        | Glu        | Ala        | Ala<br>115 | Lys        | Tyr        | Val        | Phe        | Lys<br>120 | Asp        | Ala        | Met        | Arg        | Lys<br>125 | Val        |     |
| 181<br>182               | ACG        | CTT        | CCA        | TAT        | TCT        | GGC        | AAT        | TAC        | GAA        | AGG        | CTT        | CAA        | ACT        | GCT        | GCG        | GGC        | 433 |
| 183<br>184<br>185        | Thr        | Leu        | Pro        | Tyr<br>130 | Ser        | Gly        | Asn        | Tyr        | Glu<br>135 | Arg        | Leu        | Gln        | Thr        | Ala<br>140 | Ala        | Gly        |     |
| 186<br>187               | AAA        | ATA        | AGG        | GAA        | AAT        | ATT        | CCG        | CTT        | GGA        | CTC        | CCA        | GCT        | TTG        | GAC        | AGT        | GCC        | 481 |
| 188<br>189<br>190        | Lys        | Ile        | Arg<br>145 | Glu        | Asn        | Ile        | Pro        | Leu<br>150 | Gly        | Leu        | Pro        | Ala        | Leu<br>155 | Asp        | Ser        | Ala        |     |
| 191<br>192               | ATT        | ACC        | ACT        | TTG        | TTT        | TAC        | TAC        | AAC        | GCC        | AAT        | TCT        | GCT        | GCG        | TCG        | GCA        | CTT        | 529 |
| 193<br>194<br>195        | Ile        | Thr<br>160 | Thr        | Leu        | Phe        | Tyr        | Tyr<br>165 | Asn        | Ala        | Asn        | Ser        | Ala<br>170 | Ala        | Ser        | Ala        | Leu        |     |
| 196<br>197               | ATG        | GTA        | CTC        | ATT        | CAG        | TCG        | ACG        | TCT        | GAG        | GCT        | GCG        | AGG        | TAT        | AAA        | TTT        | ATT        | 577 |
| 198<br>199<br>200        | Met<br>175 | Val        | Leu        | Ile        | Gln        | Ser<br>180 | Thr        | Ser        | Glu        | Ala<br>185 | Ala        | Arg        | Tyr        | Lys        | Phe        | Ile<br>190 |     |
| 201<br>202               | GAG        | CAA        | CAA        | ATT        | GGG        | AAG        | CGC        | GTT        | GAC        | AAA        | ACC        | TTC        | CTA        | CCA        | AGT        | TTA        | 625 |
| 203<br>204               | Glu        | Gln        | Gln        | Ile        | Gly<br>195 | Lys        | Arg        | Val        | Asp        | Lys<br>200 | Thr        | Phe        | Leu        | Pro        | Ser<br>205 | Leu        |     |

# RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

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DATE: 10/28/93

| 205<br>206  | CCA                  | א יייטיע          | אנוחא                                      | 7 CITI   | TTG   | C 7 7   | א א תי  | a com   | maa                         | mcm                      | COM           | ama        | maa        | 770       | C 2 2      | 3 mm | 673 |
|---|----------------------|-------------------|--|--|---|---|---|---|-----------------------------|--------------------------|---------------|------------|------------|-----------|------------|------|-----|
| 207   | GCA                  | AII               | AIA  | AGI  | 110   | GAA   | MMI   | AGI   | 166                         | 101                      | GCI           | CIC        | 100        | AAG       | CAA        | AII  | 673 |
| 208   | Ala                  | Ile               | Ile  | Ser  | Leu   | Glu   | Asn   | Ser   | Trp                         | Ser                      | Ala           | Leu        | Ser        | Lys       | Gln        | Ile  |     |
| 209   |                      |                   |  | 210  |   |   |   |   | 215                         |                          |               |            |            | 220       |            |      |     |
| 210   |                      |                   |  |  |   |   |   |   |                             |                          |               |            |            |           |            |      |     |
| 211   | CAG                  | ATA               | GCG  | AGT  | ACT   | AAT   | TAA   | GGA   | CAG                         | TTT                      | GAA           | ACT        | CCT        | GTT       | GTG        | CTT  | 721 |
| 212   |                      | _                 | _  |  | _   |   |   | _   | _                           |                          | _             | _          |            |           |            |      |     |
| 213   | Gln                  | Ile               |  | Ser  | Thr   | Asn   | Asn   | _   | Gln                         | Phe                      | Glu           | Thr        |            | Val       | Val        | Leu  |     |
| 214   |                      |                   | 225  |  |   |   |   | 230   |                             |                          |               |            | 235        |           |            |      |     |
| 215<br>216  | אידיא                | א א תר            | CCT  | C N N  | AAC   | C A A   | CCA   | CTTC  | አመር                         | ארידי אי                 | 700           | ייי א א    |            | CAM       | COT        | CCA  | 769 |
| 217   | AIA                  | AAI               | GCI  | CAA  | AAC   | CAA   | CGA   | GIC   | AIG                         | AIA                      | ACC           | AAI        | GII        | GAI       | GCI        | GGA  | 103 |
| 218   | Tle                  | Asn               | Δla  | Gln  | Asn   | Gln   | Ara   | Val   | Met                         | Tle                      | Thr           | Asn        | Val        | Asp       | Δla        | Glv  |     |
| 219   |                      | 240               |  |  |   | · · · · ·   | 245   |   |                             |                          |               | 250        |            |           |            | 017  |     |
| 220   |                      |                   |  |  |   |   |   |   |                             |                          |               |            |            |           |            |      |     |
| 221   | GTT                  | GTA               | ACC  | TCC  | AAC   | ATC   | GCG   | TTG   | CTG                         | CTG                      | AAT           | CGA        | AAC        | AAT       | ATG        | GCA  | 817 |
| 222   |                      |                   |  |  |   |   |   |   |                             |                          |               |            |            |           |            |      |     |
| 223   | Val                  | Val               | Thr  | Ser  | Asn   | Ile   | Ala   | Leu   | Leu                         | Leu                      | Asn           | Arg        | Asn        | Asn       | Met        | Ala  |     |
| 224   | 255                  |                   |  |  |   | 260   |   |   |                             |                          | 265           |            |            |           |            | 270  |     |
| 225   |                      |                   |  |  |   |   |   |   |                             |                          |               |            |            |           |            |      |     |
| 226   | GCC                  | ATG               | GAT  | GAC  | GAT   | GTT   | CCT   | ATG   | ACA                         | CAG                      | AGC           | TTT        | GGA        | TGT       | GGA        | AGT  | 865 |
| 227   | n1-                  | <b>1</b> /        | 7  | 7  | 7   | 77-7  | D   | <b>1</b> 4 - 4                                  | ml                          | <b>a</b> 1               | 0             | Dh.        | <b>a</b> 1 | <b>G</b>  | <b>a</b> 1 | G    |     |
| 228   | Ата                  | мет               | Asp  | Asp  | Asp   | vaı   | Pro   | мес   | Inr                         |                          | ser           | Pne        | GIA        | Cys       | _          | Ser  |     |
| 229   |                      |                   |  |  | 275   |   |   |   |                             | 280                      |               |            |            |           | 285        |      |     |
| חככ   |                      |                   |  |  |   |   |   |   |                             |                          |               |            |            |           |            |      |     |
| 230<br>231  | ייעיי                | сст               | Δጥጥ  | ͲΔСΊ   | ראאריי  | רכב ז   | <b>7</b> G  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231   | TAT                  | GCT               | ATT  | TAG:   | raac:   | rcg 1   | AG  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231<br>232  |                      |                   |  | TAG  | raact   | rcg 1   | AG  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231   |                      | GCT<br>Ala        |  | TAG:   | raact   | rcg 1   | AG  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233   |                      |                   |  |  | raact   | rcg 1   | AG  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236  | Tyr                  |                   |  |  | raact   | rcg 1   | AG  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237   |                      | Ala               | Ile  | 290  | raact   |   |   | NO:4  | <b>1</b> :                  |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238  | Tyr                  | Ala<br>INI        | Ile<br>FORM                                | 290<br>ATIO  | N FOE   | R SEÇ   | ) ID  |   |                             |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239   | Tyr                  | Ala<br>INI        | Ile<br>FORM/<br>SI                         | 290<br>ATIOI<br>EQUEI                              | N FOE   | r se(<br>Char <i>i</i>                                    | Q ID  | RIST  | CS:                         |                          |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240  | Tyr                  | Ala<br>INI        | Ile<br>FORMA<br>SI<br>(1                   | 290<br>ATIOI<br>EQUEI<br>A) I                      | n for<br>NCE (<br>LENG)   | R SEÇ<br>CHAR <i>I</i><br>TH: 2                           | Q ID<br>ACTEI<br>289 a                            | RIST:   | CS:                         | ids                      |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241   | Tyr                  | Ala<br>INI        | Ile<br>FORMA<br>SI<br>(1                   | 290 ATION EQUEN A) 1 B) 7                          | n foi<br>nce (<br>Lengi<br>rype:  | R SEÇ<br>CHARI<br>TH: 2<br>: ami                          | Q ID<br>ACTEI<br>289 a<br>ino a                   | RIST:<br>amino<br>acid                          | CS:                         | ids                      |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242  | Tyr                  | Ala<br>INI        | Ile<br>FORMA<br>SI<br>(1                   | 290 ATION EQUEN A) 1 B) 7                          | n for<br>NCE (<br>LENG)   | R SEÇ<br>CHARI<br>TH: 2<br>: ami                          | Q ID<br>ACTEI<br>289 a<br>ino a                   | RIST:<br>amino<br>acid                          | CS:                         | ids                      |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243   | Tyr (2)              | Ala<br>INI        | Ile<br>FORMA<br>SI<br>(1                   | 290 ATION EQUEN A) 1 B) 5 C) 5                     | n for<br>NCE (<br>LENGT<br>TYPE :<br>TOPOI                              | R SE(<br>CHAR!<br>TH: 2<br>: ami                          | Q ID<br>ACTEI<br>289 a<br>ino a<br>: lir          | RIST:<br>amind<br>acid<br>near                  | CS:                         | ids                      |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244  | Tyr                  | Ala<br>INI        | Ile<br>FORMA<br>SI<br>(1                   | 290 ATION EQUEN A) 1 B) 5 C) 5                     | n foi<br>nce (<br>Lengi<br>rype:  | R SE(<br>CHAR!<br>TH: 2<br>: am:<br>LOGY:                 | Q ID<br>ACTEI<br>289 a<br>ino a<br>: lir          | RIST:<br>amind<br>acid<br>near                  | CS:                         | ids                      |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243   | Tyr (2)              | Ala<br>INI<br>i)  | Ile<br>FORMA<br>SI<br>(I<br>(I             | 290 ATION EQUEN A) 1 B) 5 C) 5 C) C                | n for<br>NCE (<br>LENGT<br>TYPE :<br>TOPOI                              | R SE(<br>CHARA<br>TH: 2<br>: ami<br>LOGY:                 | Q ID<br>ACTEI<br>289 a<br>ino a<br>: lir<br>: pro | RIST:<br>amino<br>acid<br>near                  | CS:                         |                          | <b>VO:4</b> : |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245   | (2)                  | Ala<br>INI<br>i)  | Ile<br>FORMA<br>SI<br>(I<br>(I             | 290 ATION EQUEN A) 1 B) 5 C) 5 C) C                | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI                               | R SE(<br>CHARA<br>TH: 2<br>: ami<br>LOGY:                 | Q ID<br>ACTEI<br>289 a<br>ino a<br>: lir<br>: pro | RIST:<br>amino<br>acid<br>near                  | CS:                         |                          | <b>VO:4</b> : | •          |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248                                    | (2)<br>(ii)<br>(xi)  | Ala INI i)        | Ile FORMA SI (I) (I) MO                    | 290 ATION EQUEN 3) : COLECT                        | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>JLE T                      | R SEC<br>CHARA<br>TH: 2<br>: ami<br>LOGY:<br>TYPE:        | Q ID ACTEI 289 a ino a : lin : pro                | RIST:<br>amino<br>acid<br>near<br>oteir         | CS:<br>ac:                  | ID 1                     |               |            |            |           |            |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249                             | (2) (ii) (xi) Met    | Ala INI i)        | Ile FORMA SI (I) (I) MO                    | 290 ATION EQUEN 3) : COLECT                        | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>JLE T<br>NCE I             | R SEC<br>CHARA<br>TH: 2<br>: ami<br>LOGY:<br>TYPE:        | Q ID ACTEI 289 a ino a : lin : pro                | RIST:<br>amino<br>acid<br>near<br>oteir         | CS:<br>ac:                  | ID 1                     |               |            | Thr        | Leu       |            | Leu  | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249<br>250                      | (2)<br>(ii)<br>(xi)  | Ala INI i)        | Ile FORMA SI (I) (I) MO                    | 290 ATION EQUEN 3) : COLECT                        | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>JLE T                      | R SEC<br>CHARA<br>TH: 2<br>: ami<br>LOGY:<br>TYPE:        | Q ID ACTEI 289 a ino a : lin : pro                | RIST:<br>amino<br>acid<br>near<br>oteir         | CS:<br>ac:                  | ID 1                     |               |            | Thr        | Leu       | Phe<br>15  | Leu  | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249<br>250<br>251               | (2) (ii) (xi) Met    | INI i) i)         | Ile FORMA SI (I (I MC SI Arg               | 290 ATION EQUEN A) 1 B) 5 D) 5 DLECT EQUEN Phe     | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>ULE T<br>NCE I<br>Leu<br>5 | CHARA<br>TH: 2: ami<br>LOGY:<br>TYPE:<br>DESCH            | Q ID ACTER 289 a ino a : lin : pro RIPT:          | RIST:<br>amino<br>acid<br>hear<br>otein<br>ION: | CCS: o ac: n SEQ Leu        | ID 1<br>Leu<br>10        | Ile           | Leu        |            |           | 15         |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249<br>250<br>251<br>252        | (2) (ii) (xi) Met    | INI i) i)         | Ile FORMA SI (I (I MC SI Arg               | 290 ATION EQUEN A) 1 B) 5 D) 5 DLECT EQUEN Phe Ala | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>JLE T<br>NCE I             | CHARA<br>TH: 2: ami<br>LOGY:<br>TYPE:<br>DESCH            | Q ID ACTER 289 a ino a : lin : pro RIPT:          | RIST:<br>amino<br>acid<br>hear<br>otein<br>ION: | CCS: c ac: n SEQ Leu Val    | ID 1<br>Leu<br>10        | Ile           | Leu        |            | Ser       | 15         |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249<br>250<br>251<br>252<br>253 | (2) (ii) (xi) Met    | INI i) i)         | Ile FORMA SI (I (I MC SI Arg               | 290 ATION EQUEN A) 1 B) 5 D) 5 DLECT EQUEN Phe     | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>ULE T<br>NCE I<br>Leu<br>5 | CHARA<br>TH: 2: ami<br>LOGY:<br>TYPE:<br>DESCH            | Q ID ACTER 289 a ino a : lin : pro RIPT:          | RIST:<br>amino<br>acid<br>hear<br>otein<br>ION: | CCS: o ac: n SEQ Leu        | ID 1<br>Leu<br>10        | Ile           | Leu        |            |           | 15         |      | 886 |
| 231<br>232<br>233<br>234<br>235<br>236<br>237<br>238<br>239<br>240<br>241<br>242<br>243<br>244<br>245<br>246<br>247<br>248<br>249<br>250<br>251<br>252        | (2) (ii) (xi)  Met 1 | Ala INI i) i) Thr | FORMA<br>SI<br>(I<br>(I<br>MC<br>SI<br>Arg | 290 ATION EQUEN A) 1 3) 5 DLECT EQUEN Phe Ala 20   | N FOR<br>NCE (<br>LENGT<br>TYPE:<br>TOPOI<br>ULE T<br>NCE I<br>Leu<br>5 | CHARA<br>TH: 2<br>: ami<br>LOGY:<br>TYPE:<br>DESCE<br>Val | Q ID ACTER 289 a ino a : lin : pro RIPT: Leu Gly  | RIST: amino acid near otein ION: Ser            | CCS: D ac: D SEQ Leu Val 25 | ID 1<br>Leu<br>10<br>Ser | Ile<br>Phe    | Leu<br>Arg | Leu        | Ser<br>30 | 15<br>Gly  | Ala  | 886 |

# RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:28:14

| 256<br>257               |            |            | 35         |            |            |            |            | 4          | 10         |            |            |            | 45         |            |            |            |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 258<br>259<br>260        | Pro        | Asn<br>50  | Glu        | Arg        | Lys        | Leu        | Tyr<br>55  | Asp        | Ile        | Pro        | Leu        | Leu<br>60  | Arg        | Ser        | Ser        | Leu        |
| 261<br>262<br>263        | Pro<br>65  | Gly        | Ser        | Gln        | Arg        | Tyr<br>70  | Ala        | Leu        | Ile        | His        | Leu<br>75  | Thr        | Asn        | Tyr        | Ala        | Asp<br>80  |
| 264<br>265<br>266        | Glu        | Thr        | Ile        | Ser        | Val<br>85  | Ala        | Ile        | Asp        | Val        | Thr<br>90  | Asn        | Val        | Tyr        | Ile        | Met<br>95  | Gly        |
| 267<br>268<br>269        | Tyr        | Arg        | Ala        | Gly<br>100 | Asp        | Thr        | Ser        | Tyr        | Phe<br>105 | Phe        | Asn        | Glu        | Ala        | Ser<br>110 | Ala        | Thr        |
| 270<br>271<br>272        | Glu        | Ala        | Ala<br>115 | Lys        | Tyr        | Val        | Phe        | Lys<br>120 | Asp        | Ala        | Met        | Arg        | Lys<br>125 | Val        | Thr        | Leu        |
| 273<br>274<br>275        | Pro        | Tyr<br>130 | Ser        | Gly        | Asn        | Tyr        | Glu<br>135 | Arg        | Leu        | Gln        | Thr        | Ala<br>140 | Ala        | Gly        | Lys        | Ile        |
| 276<br>277<br>278        | Arg<br>145 | Glu        | Asn        | Ile        | Pro        | Leu<br>150 | Gly        | Leu        | Pro        | Ala        | Leu<br>155 | Asp        | Ser        | Ala        | Ile        | Thr<br>160 |
| 279<br>280<br>281        | Thr        | Leu        | Phe        | Tyr        | Tyr<br>165 | Asn        | Ala        | Asn        | Ser        | Ala<br>170 | Ala        | Ser        | Ala        | Leu        | Met<br>175 | Val        |
| 282<br>283<br>284        | Leu        | Ile        | Gln        | Ser<br>180 | Thr        | Ser        | Glu        | Ala        | Ala<br>185 | Arg        | Tyr        | Lys        | Phe        | Ile<br>190 | Glu        | Gln        |
| 285<br>286<br>287        | Gln        | Ile        | Gly<br>195 | Lys        | Arg        | Val        | Asp        | Lys<br>200 | Thr        | Phe        | Leu        | Pro        | Ser<br>205 | Leu        | Ala        | Ile        |
| 288<br>289<br>290        | Ile        | Ser<br>210 | Leu        | Glu        | Asn        | Ser        | Trp<br>215 | Ser        | Ala        | Leu        | Ser        | Lys<br>220 | Gln        | Ile        | Gln        | Ile        |
| 291<br>292<br>293        | Ala<br>225 | Ser        | Thr        | Asn        | Asn        | Gly<br>230 | Gln        | Phe        | Glu        | Thr        | Pro<br>235 | Val        | Val        | Leu        | Ile        | Asn<br>240 |
| 294<br>295<br>296        | Ala        | Gln        | Asn        | Gln        | Arg<br>245 | Val        | Met        | Ile        | Thr        | Asn<br>250 | Val        | Asp        | Ala        | Gly        | Val<br>255 | Val        |
| 297<br>298<br>299        | Thr        | Ser        | Asn        | Ile<br>260 | Ala        | Leu        | Leu        | Leu        | Asn<br>265 | Arg        | Asn        | Asn        | Met        | Ala<br>270 | Ala        | Met        |
| 300<br>301<br>302        | Asp<br>Ile | Asp        | Asp<br>275 | Val        | Pro        | Met        | Thr        | Gln<br>280 | Ser        | Phe        | Gly        | Cys        | Gly<br>285 | Ser        | Tyr        | Ala        |
| 303<br>304<br>305<br>306 | (2)        | INI        | FORM       | OITA       | 1 FOI      | R SEÇ      | ) ID       | NO:        | 5:         |            |            |            |            |            |            |            |

### RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

TIME: 16:28:16

DATE: 10/28/93

| 307  |   |  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
|--|---|--|---|------------------------------------|-----------------------------|------------------------------------|--|--|------------------------------------|--|---------------------------------|------------------------------------|------------------------------------|-------------------|
| 307  | (i)   | SEQUE  | NCE CHAR  | ACTE                               | RIST                        | ICS:                               |  |  |                                    |  |                                 |                                    |                                    |                   |
| 308  |   | (A)  | LENGTH:   | 1450                               | base                        | e pa:                              | irs                                    |  |                                    |  |                                 |                                    |                                    |                   |
| 309  |   | (B)  | TYPE: nu  | clei                               | c ac:                       | id                                 |  |  |                                    |  |                                 |                                    |                                    |                   |
| 310  |   | (C)  | STRANDED  | NESS:                              | : sir                       | ngle                               |  |  |                                    |  |                                 |                                    |                                    |                   |
| 311  |   | (D)  | TOPOLOGY  | : lir                              | near                        | -                                  |  |  |                                    |  |                                 |                                    |                                    |                   |
| 312  |   |  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 313  | (ii)  | MOLEC  | ULE TYPE  | : DNA                              | A (ge                       | enom:                              | ic)                                    |  |                                    |  |                                 |                                    |                                    |                   |
| 314  |   |  |   |                                    | _                           |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 315  | (iii)   | HYPOT  | HETICAL:  | NO                                 |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 316  |   |  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 317  | (iv)  | ANTI-  | SENSE: N  | O                                  |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 318  |   |  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 319  | (vi)  | ORIGI  | NAL SOUR  | CE:                                |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 320  |   | (A)  | ORGANISM  | : Ory                              | yza s                       | sativ                              | <i>r</i> a                             |  |                                    |  |                                 |                                    |                                    |                   |
| 321  |   | ,  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 322  | (vii)   | IMMED  | IATE SOU  | RCE:                               |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 323  | ( ,   |  | CLONE: a  |                                    | -amv                        | lase                               |  |  |                                    |  |                                 |                                    |                                    |                   |
| 324  |   | (-/  |   | _F                                 | J                           |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 325  | (ix)  | FEATU  | RE:   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 326  | (===,   |  | NAME/KEY  | : CDS                              | s (B)                       | LO                                 | CATIO                                  | N:   | 12.                                | . 1316                                 | 5                               |                                    |                                    |                   |
| 327  |   |  | LOCATION  |                                    |                             |                                    |  |  |                                    |  | •                               |                                    |                                    |                   |
| 328  |   | (-)  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 329  | (xi)  | SEOUE  | NCE DESC  | RTPTI                              | TON:                        | SEO                                | TD 1                                   | 10 · ·                                       | <u>.</u>                           |  |                                 |                                    |                                    |                   |
| 330  | (222)   | 52952  | 5250  |                                    | . 0                         | x                                  |  |  |                                    |  |                                 |                                    |                                    |                   |
| 331  | ССТССВ  | GTG C AT   | G CAG GT  | G CTC                              | 2 220                       | ם אכנ                              | י איינ                                 | 3 GT(  | 3 AA                               | ~ A (                                  | י אמי                           | י יאים                             | rrc                                | 48                |
| 332  | 00100   | 010 0 111  | 0 0.10 01   | 0 010                              |                             | - 110                              |  |  |                                    | • •• •                                 | 0210                            |                                    |                                    | 10                |
|  |   |  |   |                                    |                             |                                    |  |  |                                    |  |                                 |                                    |                                    |                   |
| 444  |   | Me   | t Gln Va  | l Lei                              | ı Agı                       | ı Thi                              | - Met                                  | · Va   | l Ası                              | a Tay                                  | s His                           | g Ph                               | - T.e.11                           |                   |
| 333<br>334   |   |  | t Gln Va<br>1   | l Leu                              |                             |                                    | . Met                                  | . Va   | l Ası                              | _                                      |                                 | s Phe                              | e Leu                              |                   |
| 334  |   |  | t Gln Va<br>1   | l Leu                              |                             | n Thi                              | c Met                                  | : Va   | l Ası                              | 1 Ly:                                  |                                 | s Phe                              | e Leu                              |                   |
| 334<br>335   | <b>ጥ</b> ሮሮ ሮሞ፣   |  | 1   |                                    | į                           | 5                                  |  |  |                                    | 10                                     | 0                               |                                    |                                    | 96                |
| 334<br>335<br>336  | TCC CTI   |  | 1   |                                    | į                           | 5                                  |  |  |                                    | 10                                     | 0                               |                                    |                                    | 96                |
| 334<br>335<br>336<br>337   |   | TCG GTC  | CTC ATC   | GTC                                | CTC                         | CTT                                | GGC                                    | CTC  | TCC                                | TCC                                    | D<br>AAC                        | TTG                                | ACA                                | 96                |
| 334<br>335<br>336<br>337<br>338  | Ser Leu   | TCG GTC  | CTC ATC   | GTC<br>Val                         | CTC                         | CTT                                | GGC                                    | CTC  | TCC<br>Ser                         | TCC                                    | D<br>AAC                        | TTG                                | ACA                                | 96                |
| 334<br>335<br>336<br>337<br>338<br>339   |   | TCG GTC  | CTC ATC   | GTC                                | CTC                         | CTT                                | GGC                                    | CTC  | TCC                                | TCC                                    | D<br>AAC                        | TTG                                | ACA                                | 96                |
| 334<br>335<br>336<br>337<br>338<br>339<br>340  | Ser Leu<br>15   | TCG GTC  | 1<br>CTC ATC<br>Leu Ile                                       | GTC<br>Val<br>20                   | CTC<br>Leu                  | CTT<br>Leu                         | GGC<br>Gly                             | CTC<br>Leu                                   | TCC<br>Ser<br>25                   | TCC<br>Ser                             | AAC<br>Asn                      | TTG<br>Leu                         | ACA<br>Thr                         |                   |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341   | Ser Leu<br>15   | TCG GTC  | 1<br>CTC ATC<br>Leu Ile                                       | GTC<br>Val<br>20                   | CTC<br>Leu                  | CTT<br>Leu                         | GGC<br>Gly                             | CTC<br>Leu                                   | TCC<br>Ser<br>25                   | TCC<br>Ser                             | AAC<br>Asn                      | TTG<br>Leu                         | ACA<br>Thr                         | 96<br>144         |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342  | Ser Leu<br>15<br>GCC GGG  | TCG GTC Ser Val  | CTC ATC Leu Ile   | GTC<br>Val<br>20<br>CAG            | CTC<br>Leu<br>GGA           | CTT<br>Leu<br>TTC                  | GGC<br>Gly<br>AAC                      | CTC<br>Leu<br>TGG                            | TCC<br>Ser<br>25<br>GAG            | TCC<br>Ser                             | AAC<br>Asn<br>TGG               | TTG<br>Leu<br>AAG                  | ACA<br>Thr<br>GAG                  |                   |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343   | Ser Leu<br>15<br>GCC GGG<br>Ala Gly                             | TCG GTC  | CTC ATC Leu Ile CTG TTT Leu Phe                               | GTC Val 20 CAG                     | CTC<br>Leu<br>GGA           | CTT<br>Leu<br>TTC                  | GGC<br>Gly<br>AAC                      | CTC<br>Leu<br>TGG<br>Trp                     | TCC<br>Ser<br>25<br>GAG            | TCC<br>Ser                             | AAC<br>Asn<br>TGG               | TTG<br>Leu<br>AAG                  | ACA<br>Thr<br>GAG<br>Glu           |                   |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343   | Ser Leu<br>15<br>GCC GGG  | TCG GTC Ser Val  | CTC ATC Leu Ile   | GTC Val 20 CAG                     | CTC<br>Leu<br>GGA           | CTT<br>Leu<br>TTC                  | GGC<br>Gly<br>AAC                      | CTC<br>Leu<br>TGG                            | TCC<br>Ser<br>25<br>GAG            | TCC<br>Ser                             | AAC<br>Asn<br>TGG               | TTG<br>Leu<br>AAG                  | ACA<br>Thr<br>GAG                  |                   |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345   | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30                       | TCG GTC Ser Val CAA GTC  | CTC ATC Leu Ile CTG TTT Leu Phe 35                            | GTC Val 20 CAG                     | CTC<br>Leu<br>GGA<br>Gly    | CTT<br>Leu<br>TTC                  | GGC<br>Gly<br>AAC<br>Asn               | CTC<br>Leu<br>TGG<br>Trp<br>40               | TCC<br>Ser<br>25<br>GAG<br>Glu     | TCC<br>Ser<br>TCG<br>Ser               | AAC<br>Asn<br>TGG<br>Trp        | TTG<br>Leu<br>AAG<br>Lys           | ACA<br>Thr<br>GAG<br>Glu<br>45     | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346  | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30                       | TCG GTC Ser Val  | CTC ATC Leu Ile CTG TTT Leu Phe 35                            | GTC Val 20 CAG                     | CTC<br>Leu<br>GGA<br>Gly    | CTT<br>Leu<br>TTC                  | GGC<br>Gly<br>AAC<br>Asn               | CTC<br>Leu<br>TGG<br>Trp<br>40               | TCC<br>Ser<br>25<br>GAG<br>Glu     | TCC<br>Ser<br>TCG<br>Ser               | AAC<br>Asn<br>TGG<br>Trp        | TTG<br>Leu<br>AAG<br>Lys           | ACA<br>Thr<br>GAG<br>Glu<br>45     |                   |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347   | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30<br>AAT GGC            | TCG GTC Ser Val CAA GTC Gln Val                                    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC                    | GTC Val 20 CAG Gln TTC             | CTC<br>Leu<br>GGA<br>Gly    | CTT Leu TTC Phe                    | GGC<br>Gly<br>AAC<br>Asn<br>GGC        | CTC<br>Leu<br>TGG<br>Trp<br>40               | TCC<br>Ser<br>25<br>GAG<br>Glu     | TCC<br>Ser<br>TCG<br>Ser               | AAC Asn TGG Trp GAC             | TTG<br>Leu<br>AAG<br>Lys           | ACA Thr GAG Glu 45 GCC             | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347   | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30<br>AAT GGC            | TCG GTC Ser Val CAA GTC  | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC                    | GTC Val 20 CAG Gln TTC             | CTC<br>Leu<br>GGA<br>Gly    | CTT Leu TTC Phe                    | GGC<br>Gly<br>AAC<br>Asn<br>GGC<br>Gly | CTC<br>Leu<br>TGG<br>Trp<br>40               | TCC<br>Ser<br>25<br>GAG<br>Glu     | TCC<br>Ser<br>TCG<br>Ser               | AAC Asn TGG Trp GAC             | TTG Leu AAG Lys ATC                | ACA Thr GAG Glu 45 GCC             | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349   | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30<br>AAT GGC            | TCG GTC Ser Val CAA GTC Gln Val                                    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC                    | GTC Val 20 CAG Gln TTC             | CTC<br>Leu<br>GGA<br>Gly    | CTT Leu TTC Phe                    | GGC<br>Gly<br>AAC<br>Asn<br>GGC        | CTC<br>Leu<br>TGG<br>Trp<br>40               | TCC<br>Ser<br>25<br>GAG<br>Glu     | TCC<br>Ser<br>TCG<br>Ser               | AAC Asn TGG Trp GAC             | TTG<br>Leu<br>AAG<br>Lys           | ACA Thr GAG Glu 45 GCC             | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350                                    | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30<br>AAT GGC<br>Asn Gly | TCG GTC Ser Val CAA GTC Gln Val GGG TGG                            | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50         | GTC Val 20 CAG Gln TTC Phe         | CTC Leu GGA Gly CTG Leu     | CTT Leu TTC Phe ATG                | GGC Gly AAC Asn GGC Gly 55             | CTC<br>Leu<br>TGG<br>Trp<br>40<br>AAG<br>Lys | TCC Ser 25 GAG Glu GTG Val         | TCC<br>Ser<br>TCG<br>Ser<br>GAC<br>Asp | AAC Asn TGG Trp GAC Asp         | TTG Leu AAG Lys ATC Ile 60         | ACA Thr GAG Glu 45 GCC Ala         | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351                             | Ser Leu<br>15<br>GCC GGG<br>Ala Gly<br>30<br>AAT GGC<br>Asn Gly | TCG GTC Ser Val CAA GTC Gln Val                                    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50         | GTC Val 20 CAG Gln TTC Phe         | CTC Leu GGA Gly CTG Leu     | CTT Leu TTC Phe ATG                | GGC Gly AAC Asn GGC Gly 55             | CTC<br>Leu<br>TGG<br>Trp<br>40<br>AAG<br>Lys | TCC Ser 25 GAG Glu GTG Val         | TCC<br>Ser<br>TCG<br>Ser<br>GAC<br>Asp | AAC Asn TGG Trp GAC Asp         | TTG Leu AAG Lys ATC Ile 60         | ACA Thr GAG Glu 45 GCC Ala         | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351<br>352                      | Ser Leu 15 GCC GGG Ala Gly 30 AAT GGC Asn Gly GCA GCC           | TCG GTC Ser Val CAA GTC Gln Val GGG TGG Gly Trp                    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50 ACC CAC | GTC Val 20 CAG Gln TTC Phe         | CTC Leu GGA Gly CTG Leu TGG | CTT Leu TTC Phe ATG Met CTC        | GGC Gly AAC GGC Gly 55 CCT             | CTC Leu TGG Trp 40 AAG Lys                   | TCC Ser 25 GAG Glu GTG Val         | TCC Ser TCG Ser GAC Asp                | AAC Asn TGG Trp GAC Asp         | TTG Leu AAG Lys ATC Ile 60 TCT     | ACA Thr GAG Glu 45 GCC Ala         | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351<br>352<br>353               | Ser Leu 15 GCC GGG Ala Gly 30 AAT GGC Asn Gly GCA GCC           | TCG GTC Ser Val CAA GTC Gln Val GGG TGG Gly Trp GGC ATC Gly Ile    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50 ACC CAC | GTC Val 20 CAG Gln TTC Phe         | CTC Leu GGA Gly CTG Leu TGG | CTT Leu TTC Phe ATG Met CTC Leu    | GGC Gly GGC Gly 55 CCT                 | CTC Leu TGG Trp 40 AAG Lys                   | TCC Ser 25 GAG Glu GTG Val         | TCC Ser TCG Ser GAC Asp                | AAC Asn TGG Trp GAC Asp CAC His | TTG Leu AAG Lys ATC Ile 60 TCT     | ACA Thr GAG Glu 45 GCC Ala         | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351<br>352<br>353               | Ser Leu 15 GCC GGG Ala Gly 30 AAT GGC Asn Gly GCA GCC           | TCG GTC Ser Val CAA GTC Gln Val GGG TGG Gly Trp                    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50 ACC CAC | GTC Val 20 CAG Gln TTC Phe         | CTC Leu GGA Gly CTG Leu TGG | CTT Leu TTC Phe ATG Met CTC        | GGC Gly GGC Gly 55 CCT                 | CTC Leu TGG Trp 40 AAG Lys                   | TCC Ser 25 GAG Glu GTG Val         | TCC Ser TCG Ser GAC Asp                | AAC Asn TGG Trp GAC Asp         | TTG Leu AAG Lys ATC Ile 60 TCT     | ACA Thr GAG Glu 45 GCC Ala         | 144               |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351<br>352<br>353<br>354<br>355 | Ser Leu 15 GCC GGG Ala Gly 30 AAT GGC Asn Gly GCA GCC Ala Ala   | TCG GTC Ser Val CAA GTC Gln Val GGG TGG Gly Trp GGC ATC Gly Ile 65 | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50 ACC CAC | GTC Val 20 CAG Gln TTC Phe GTC Val | CTC Leu GGA Gly CTG Leu TGG | CTT Leu TTC Phe ATG Met CTC Leu 70 | GGC Gly AAC Asn GGC Gly 55 CCT Pro     | CTC Leu TGG Trp 40 AAG Lys CCG Pro           | TCC Ser 25 GAG Glu GTG Val CCG Pro | TCC Ser TCG Ser GAC Asp TCT Ser        | AAC Asn TGG Trp GAC Asp CAC His | TTG Leu AAG Lys ATC Ile 60 TCT Ser | ACA Thr GAG Glu 45 GCC Ala GTC Val | 144<br>192<br>240 |
| 334<br>335<br>336<br>337<br>338<br>339<br>340<br>341<br>342<br>343<br>344<br>345<br>346<br>347<br>348<br>349<br>350<br>351<br>352<br>353               | Ser Leu 15 GCC GGG Ala Gly 30 AAT GGC Asn Gly GCA GCC Ala Ala   | TCG GTC Ser Val CAA GTC Gln Val GGG TGG Gly Trp GGC ATC Gly Ile    | CTC ATC Leu Ile CTG TTT Leu Phe 35 TAC AAC Tyr Asn 50 ACC CAC | GTC Val 20 CAG Gln TTC Phe GTC Val | CTC Leu GGA Gly CTG Leu TGG | CTT Leu TTC Phe ATG Met CTC Leu 70 | GGC Gly AAC Asn GGC Gly 55 CCT Pro     | CTC Leu TGG Trp 40 AAG Lys CCG Pro           | TCC Ser 25 GAG Glu GTG Val CCG Pro | TCC Ser TCG Ser GAC Asp TCT Ser        | AAC Asn TGG Trp GAC Asp CAC His | TTG Leu AAG Lys ATC Ile 60 TCT Ser | ACA Thr GAG Glu 45 GCC Ala GTC Val | 144               |

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| 358<br>359<br>360 | Gly        | Glu        | Gln<br>80  | Gly        | Tyr        | Met        | Pro        | Gly<br>85  | Arg        | Leu        | Tyr        | Asp        | Leu<br>90  | Asp        | Ala        | Ser        |     |
|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|
| 361<br>362        | AAG        | TAC        | GGC        | AAC        | GAG        | GCG        | CAG        | CTC        | AAG        | TCG        | CTG        | ATC        | GAG        | GCG        | TTC        | CAT        | 336 |
| 363<br>364<br>365 | Lys        | Tyr<br>95  | Gly        | Asn        | Glu        | Ala        | Gln<br>100 | Leu        | Lys        | Ser        | Leu        | Ile<br>105 | Glu        | Ala        | Phe        | His        |     |
| 366<br>367        | GGC        | AAG        | GGC        | GTC        | CAG        | GTG        | ATC        | GCC        | GAC        | ATC        | GTC        | ATC        | AAC        | CAC        | CGC        | ACG        | 384 |
| 368<br>369<br>370 | Gly<br>110 | Lys        | Gly        | Val        | Gln        | Val<br>115 | Ile        | Ala        | Asp        | Ile        | Val<br>120 | Ile        | Asn        | His        | Arg        | Thr<br>125 |     |
| 371<br>372        | GCG        | GAG        | CAC        | AAG        | GAC        | GGC        | CGC        | GGC        | ATC        | TAC        | TGC        | CTC        | TTC        | GAG        | GGC        | GGG        | 432 |
| 373<br>374<br>375 | Ala        | Glu        | His        | Lys        | Asp<br>130 | Gly        | Arg        | Gly        | Ile        | Tyr<br>135 | Cys        | Leu        | Phe        | Glu        | Gly<br>140 | Gly        |     |
| 376<br>377        | ACG        | CCC        | GAC        | TCC        | CGC        | CTC        | GAC        | TGG        | GGC        | CCG        | CAC        | ATG        | ATC        | TGC        | CGC        | GAC        | 480 |
| 378<br>379<br>380 | Thr        | Pro        | Asp        | Ser<br>145 | Arg        | Leu        | Asp        | Trp        | Gly<br>150 | Pro        | His        | Met        | Ile        | Cys<br>155 | Arg        | Asp        |     |
| 381<br>382        | GAC        | CCC        | TAC        | GGC        | CAT        | GGC        | ACC        | GGC        | AAC        | CCG        | GAC        | ACC        | GGC        | GCC        | GAC        | TTC        | 528 |
| 383<br>384<br>385 | Asp        | Pro        | Tyr<br>160 | Gly        | Asp        | Gly        | Thr        | Gly<br>165 | Asn        | Pro        | Asp        | Thr        | Gly<br>170 | Ala        | Asp        | Phe        |     |
| 386<br>387        | GCC        | GCC        | GCG        | CCG        | GAC        | ATC        | GAC        | CAC        | CTC        | AAC        | AAG        | CGC        | GTC        | CAG        | CGG        | GAG        | 576 |
| 388<br>389<br>390 | Ala        | Ala<br>175 | Ala        | Pro        | Asp        | Ile        | Asp<br>180 | His        | Leu        | Asn        | Lys        | Arg<br>185 | Val        | Gln        | Arg        | Glu        |     |
| 391<br>392        | CTC        | ATT        | GGC        | TGG        | CTC        | GAC        | TGG        | CTC        | AAG        | ATG        | GAC        | ATC        | GGC        | TTC        | GAC        | GCG        | 624 |
| 393<br>394<br>395 | Leu<br>190 | Ile        | Gly        | Trp        | Leu        | Asp<br>195 | Trp        | Leu        | Lys        | Met        | Asp<br>200 | Ile        | Gly        | Phe        | Asp        | Ala<br>205 |     |
| 396<br>397        | TGG        | CGC        | CTC        | GAC        | TTC        | GCC        | AAG        | GGC        | TAC        | TCC        | GCC        | GAC        | ATG        | GCA        | AAC        | ATC        | 672 |
| 398<br>399<br>400 | Trp        | Arg        | Leu        | Asp        | Phe<br>210 | Ala        | Lys        | Gly        | Tyr        | Ser<br>215 | Ala        | Asp        | Met        | Ala        | Lys<br>220 | Ile        |     |
| 401<br>402        | TAC        | ATC        | GAC        | GCC        | ACC        | GAG        | CCG        | AGC        | TTC        | GCC        | GTG        | CCC        | GAG        | ATA        | TCG        | ACG        | 720 |
| 403<br>404<br>405 | Tyr        | Ile        | Asp        | Ala<br>225 | Thr        | Glu        | Pro        | Ser        | Phe<br>230 | Ala        | Val        | Ala        | Glu        | Ile<br>235 | Trp        | Thr        |     |
| 406<br>407        | TCC        | ATG        | GCG        | AAC        | GGC        | GGG        | GAC        | GGC        | AAG        | CCG        | AAC        | TAC        | GAC        | CAG        | AAC        | GCG        | 768 |
| 408               | Ser        | Met        | Ala        | Asn        | Gly        | Gly        | Asp        | Gly        | Lys        | Pro        | Asn        | Tyr        | Asp        | Gln        | Asn        | Ala        |     |

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| 409                      |            |            | 240        |            |            |            |            | 245        |            |            |            |            | 250        |            |            |            |      |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------|
| 410<br>411               | CAC        | CGG        | CAG        | GAG        | CTG        | GTC        | AAC        | TGG        | GTC        | GAT        | CGT        | GTC        | GGC        | GGC        | GCC        | AAC        | 816  |
| 412<br>413<br>414<br>415 | His        | Arg<br>255 | Gln        | Glu        | Leu        | Val        | Asn<br>260 | Trp        | Val        | Asp        | Arg        | Val<br>265 | Gly        | Gly        | Ala        | Asn        |      |
| 416<br>417               | ACC        | AAC        | GGC        | ACG        | GCG        | TTC        | GAC        | TTC        | ACC        | ACC        | AAG        | GGC        | ATC        | CTC        | AAC        | GTC        | 864  |
| 418<br>419<br>420        | Ser<br>270 | Asn        | Gly        | Thr        | Ala        | Phe<br>275 | Asp        | Phe        | Thr        | Thr        | Lys<br>280 | Gly        | Ile        | Leu        | Asn        | Val<br>285 |      |
| 421<br>422               | GCC        | GTG        | GAG        | GGC        | GAG        | CTG        | TGG        | CGC        | CTC        | CGC        | GGC        | GAG        | GAC        | GGC        | AAG        | GCG        | 912  |
| 423<br>424<br>425        | Ala        | Val        | Glu        | Gly        | Glu<br>290 | Leu        | Trp        | Arg        | Leu        | Arg<br>295 | Gly        | Glu        | Asp        | Gly        | Lys<br>300 | Ala        |      |
| 426<br>427               | CCC        | GGC        | ATG        | ATC        | GGG        | TGC        | TGG        | CCG        | GCC        | AAG        | GCG        | ACG        | ACC        | TTC        | GTC        | GAC        | 960  |
| 428<br>429<br>430        | Pro        | Gly        | Met        | Ile<br>305 | Gly        | Trp        | Trp        | Pro        | Ala<br>310 | Lys        | Ala        | Thr        | Thr        | Phe<br>315 | Val        | Asp        |      |
| 431<br>432               | AAC        | CAC        | GAC        | ACC        | GGC        | TCG        | ACG        | CAG        | CAC        | CTG        | TGG        | CCG        | TTC        | CCC        | TCC        | GAC        | 1008 |
| 433<br>434<br>435        | Asn        | His        | Asp<br>320 | Thr        | Gly        | Ser        | Thr        | Gln<br>325 | His        | Leu        | Trp        | Pro        | Phe<br>330 | Pro        | Ser        | Asp        |      |
| 436<br>437               | AAG        | GTC        | ATG        | CAG        | GGC        | TAC        | GCA        | TAC        | ATC        | CTC        | ACC        | CAC        | CCC        | GGC        | AAC        | CCA        | 1056 |
| 438<br>439<br>440        | Lys        | Val<br>335 | Met        | Gln        | Gly        | Tyr        | Ala<br>340 | Tyr        | Ile        | Leu        | Thr        | His<br>345 | Pro        | Gly        | Asn        | Pro        |      |
| 441<br>442               | TGC        | ATC        | TTG        | TAC        | GAC        | CAT        | TTC        | TTC        | GAT        | TGG        | GGT        | CTC        | AAG        | GAG        | GAG        | ATC        | 1104 |
| 443<br>444<br>445        | Cys<br>350 | Ile        | Phe        | Tyr        | Asp        | His<br>355 | Phe        | Phe        | Asp        | Trp        | Gly<br>360 | Leu        | Lys        | Glu        | Glu        | Ile<br>365 |      |
| 446<br>447               | GAG        | CGC        | CTG        | GTG        | TCA        | ATC        | AGA        | AAC        | CGG        | CAG        | GGG        | ATC        | CAC        | CCG        | GCG        | AGC        | 1152 |
| 448<br>449<br>450        | Glu        | Arg        | Leu        | Val        | Ser<br>370 |            |            |            | Arg        |            |            |            | His        | Pro        | Ala<br>380 |            |      |
| 451<br>452               | GAG        | CTG        | CGC        | ATC        | ATG        | GAA        | GCT        | GAC        | AGC        | GAT        | CTC        | TAC        | CTC        | GCG        | GAG        | ATC        | 1200 |
| 453<br>454<br>455        | Glu        | Leu        | Arg        | Ile<br>385 | Met        | Glu        | Ala        | Asp        | Ser<br>390 | Asp        | Leu        | Tyr        | Leu        | Ala<br>395 | Glu        | Ile        |      |
| 456<br>457               | GAT        | GGC        | AAG        | GTG        | ATC        | ACA        | AAG        | ATT        | GGA        | CCA        | AGA        | TAC        | GAC        | GTC        | GAA        | CAC        | 1248 |
| 458<br>459               | Asp        | Gly        | Lys<br>400 | Val        | Ile        | Thr        | Lys        | Ile<br>405 | Gly        | Pro        | Arg        | Tyr        | Asp<br>410 | Val        | Glu        | His .      |      |

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| 460<br>461        | CTC ATC        | CCC G.     | AA GGC       | TTC   | CAG            | GTC       | GTC        | GCG       | CAC   | GGT        | GAT       | GGC        | TAC       | GCA    | 1296 |
|-------------------|----------------|------------|--------------|-------|----------------|-----------|------------|-----------|-------|------------|-----------|------------|-----------|--------|------|
| 462<br>463<br>464 | Leu Ile<br>415 | Pro G      | lu Gly       | Phe   | Gln<br>420     | Val       | Val        | Ala       | His   | Gly<br>425 | Asp       | Gly        | Tyr       | Ala    |      |
| 465<br>466        | ATC TGG        | GAG A      | AA ATC       | TGAG  | GCGC2          | ACG 1     | ATGA       | CGAG      | AC TO | CTCAC      | STTT      | A GC       | AGAT'     | ГТАА   | 1351 |
| 467<br>468<br>469 | Ile Trp        | Glu L      | ys LIe       | 435   | 5              |           |            |           |       |            |           |            |           |        |      |
| 470<br>471<br>472 | CCTGCGA        | TTT TT.    | ACCCTG       | AC CG | GTA            | racg:     | r atz      | ATACO     | STGC  | CGG        | CAAC      | GAG (      | CTGT      | ATCCGA | 1411 |
| 473<br>474<br>475 | TCCGAAT        | TAC GG.    | ATGCAA'      | rt Gi | CCA            | CGAA      | G TC       | CTCG      | AGG   |            |           |            |           |        | 1450 |
| 476<br>477        |                |            |              |       |                |           |            |           |       |            |           |            |           |        |      |
| 478<br>479        | (2) IN         | FORMAT     | ION FO       | R SEÇ | ) ID           | NO:       | 6:         |           |       |            |           |            |           |        |      |
| 480               | (i)            |            | UENCE (      |       |                |           |            | _         |       |            |           |            |           |        |      |
| 481<br>482        |                | (A)<br>(B) | LENG:        |       |                |           | o ac:      | ids       |       |            |           |            |           |        |      |
| 483               |                | (D)        |              |       |                |           |            |           |       |            |           |            |           |        |      |
| 484               |                |            |              |       |                |           |            |           |       |            |           |            |           |        |      |
| 485<br>486        | (ii)           | MOL        | ECULE ?      | rype: | pro            | otei      | n          |           |       |            |           |            |           |        |      |
| 487               | (xi)           | SEQ        | UENCE I      | DESCR | RIPT           | ON:       | SEQ        | ID 1      | NO: 6 | 5:         |           |            |           |        |      |
| 488               | W-+ 01-        | 77-7 T     | <b>-</b>     | ml    | <b>1</b> 4 - L | **- 7     | <b>3</b>   | <b>T</b>  | **.   | D1         | <b>.</b>  | <b>a</b>   | •         | Q      |      |
| 489<br>490<br>491 | Met Gln<br>1   | val L      | eu Asn<br>5  | Thr   | мес            | vai       | ASII       | Lys<br>10 | HIS   | Pne        | ьeu       | ser        | ьец<br>15 | ser    |      |
| 492<br>493<br>494 | Val Leu        |            | al Leu<br>20 | Leu   | Gly            | Leu       | Ser<br>25  | Ser       | Asn   | Leu        | Thr       | Ala<br>30  | Gly       | Gln    |      |
| 495<br>496<br>497 | Val Leu        | Phe G      | ln Gly       | Phe   | Asn            | Trp<br>40 | Glu        | Ser       | Trp   | Lys        | Glu<br>45 | Asn        | Gly       | Gly    |      |
| 498<br>499<br>500 | Trp Tyr<br>50  | Asn P      | he Leu       | Met   | Gly<br>55      | Lys       | Val        | Asp       | Asp   | Ile<br>60  | Ala       | Ala        | Ala       | Gly    |      |
| 501               | Ile Thr        | His V      | al Trp       | Leu   | Pro            | Pro       | Pro        | Ser       | His   | Ser        | Val       | Gly        | Glu       | Gln    |      |
| 502<br>503        | 65             |            |              | 70    |                |           |            |           | 75    |            |           |            |           | 80     |      |
| 503<br>504        | Gly Tyr        | Met P      | ro Gly       | Arg   | Leu            | Tyr       | Asp        | Leu       | Asp   | Ala        | Ser       | Lys        | Tyr       | Gly    |      |
| 505<br>506        |                |            | 85           | J     |                | •         | -          | 90        | •     |            |           | -          | 95        | -      |      |
| 507<br>508<br>509 | Asn Glu        |            | ln Leu<br>00 | Lys   | Ser            | Leu       | Ile<br>105 | Glu       | Ala   | Phe        | His       | Gly<br>110 | Lys       | Gly    |      |
| 510               | Val Gln        | Val I      | le Ala       | Asp   | Ile            | Val       | Ile        | Asn       | His   | Arg        | Thr       | Ala        | Glu       | His    |      |

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| 511        |         |           | 115            |             |                |      |        | 100  |           |           |          |      | 105  |          |       |            |
|------------|---------|-----------|----------------|-------------|----------------|------|--------|------|-----------|-----------|----------|------|------|----------|-------|------------|
| 512        |         |           | 115            |             |                |      |        | 120  |           |           |          |      | 125  |          |       |            |
| 513        | Lys     | Asp       | Gly            | Arg         | Gly            | Ile  | Tyr    | Cys  | Leu       | Phe       | Glu      | Gly  | Gly  | Thr      | Pro   | Asp        |
| 514        | _       | 130       | _              | _           | -              |      | 135    | -    |           |           |          | 140  | -    |          |       | -          |
| 515        |         |           |                |             |                | _    |        |      |           |           |          |      |      |          |       |            |
| 516        |         | Arg       | Leu            | Asp         | Trp            | _    | Pro    | His  | Met       | Ile       | _        | Arg  | Asp  | Asp      | Pro   | _          |
| 517        | 145     |           |                |             |                | 150  |        |      |           |           | 155      |      |      |          |       | 160        |
| 518<br>519 | C111    | 7 an      | C111           | Th~         | Gly            | 7 an | Dwo    | 7 ~~ |           | <b>01</b> | 71.      | 7 ~~ | Dho  | 77-      | 77.   | 77.        |
| 520        | GLY     | Asp       | Gry            | 1111        | 165            | ASII | PIO    | Asp  | TIII      | 170       | ALA      | Asp  | Pile | ALA      | 175   | Ala        |
| 521        |         |           |                |             | 103            |      |        |      |           | 1/0       |          |      |      |          | 1/3   |            |
| 522        | Pro     | Asp       | Ile            | asp         | His            | Leu  | Asn    | Lvs  | Ara       | Val       | Gln      | Ara  | Glu  | Leu      | Ile   | Glv        |
| 523        |         | -         |                | 180         |                |      |        | •    | 185       |           |          | _    |      | 190      |       | 2          |
| 524        |         |           |                |             |                |      |        |      |           |           |          |      |      |          |       |            |
| 525        | Trp     | Leu       | Asp            | Trp         | Leu            | Lys  | Met    | Asp  | Ile       | Gly       | Phe      | Asp  | Ala  | Trp      | Arg   | Leu        |
| 526        |         |           | 195            |             |                |      |        | 200  |           |           |          |      | 205  |          |       |            |
| 527        | _       |           |                | _           |                | _    | _      |      |           |           |          |      |      |          | _     |            |
| 528        | Asp     |           | Ala            | Lys         | Gly            | Tyr  |        | Ala  | Asp       | Met       | Ala      | -    | Ile  | Tyr      | Ile   | Asp        |
| 529        |         | 210       |                |             |                |      | 215    |      |           |           |          | 220  |      |          |       |            |
| 530<br>531 | Nla     | Thr       | Glu            | Dro         | Ser            | Dho  | ת 1 ת  | 7727 | λla       | Glu.      | T10      | Trn  | Thr  | cor      | Mot   | ח ד ח      |
| 532        | 225     | 1111      | GIU            | PLO         | 261            | 230  | Ата    | val  | нта       | Giu       | 235      | тър  | 1111 | SET      | MEC   | 240        |
| 533        |         |           |                |             |                | 230  |        |      |           |           | 200      |      |      |          |       | 240        |
| 534        | Asn     | Gly       | Gly            | Asp         | Gly            | Lys  | Pro    | Asn  | Tyr       | Asp       | Gln      | Asn  | Ala  | His      | Arg   | Gln        |
| 535        |         | _         | _              | _           | 245            | -    |        |      | -         | 250       |          |      |      |          | 255   |            |
| 536        |         |           |                |             |                |      |        |      |           |           |          |      |      |          |       |            |
| 537        | Glu     | Leu       | Val            |             | $\mathtt{Trp}$ | Val  | Asp    | Arg  |           | Gly       | Gly      | Ala  | Asn  |          | Asn   | Gly        |
| 538        |         |           |                | 260         |                |      |        |      | 265       |           |          |      |      | 270      |       |            |
| 539<br>540 | mb se   | 71.       | Dha            | 7 ~~        | Dha            | mb   | Mla sa | *    | <b>~1</b> | T1 -      | T        | 7    | 77-7 | 71-      | 77-7  | <b>a</b> 1 |
| 540<br>541 | 1111    | Ата       | 275            | Asp         | Phe            | 1111 | TILL   | 280  | GIÀ       | 116       | ьeu      | ASII | 285  | Ala      | vai   | GIU        |
| 542        |         |           | 275            |             |                |      |        |      |           |           |          |      | 203  |          |       |            |
| 543        | Gly     | Glu       | Leu            | Trp         | Arg            | Leu  | Arq    | Gly  | Glu       | Asp       | Gly      | Lys  | Ala  | Pro      | Glv   | Met        |
| 544        | •       | 290       |                | -           | •              |      | 295    | •    |           | -         | •        | 300  |      |          | •     |            |
| 545        |         |           |                |             |                |      |        |      |           |           |          |      |      |          |       |            |
| 546        |         | Gly       | $\mathtt{Trp}$ | ${\tt Trp}$ | Pro            | Ala  | Lys    | Ala  | Thr       | Thr       | Phe      | Val  | Asp  | Asn      | His   | _          |
| 547        | 305     |           |                |             |                | 310  |        |      |           |           | 315      |      |      |          |       | 320        |
| 548        | m1      | <b>01</b> | <b>a</b>       | <b>m</b> 1  | <b>a</b> 1     | ***  |        | m    | <b>D</b>  | D1        | <b>n</b> |      |      | <b>-</b> | **- 7 | 30-6       |
| 549<br>550 | Thr     | GIY       | ser            | Thr         | Gln<br>325     | HIS  | ьeu    | Trp  | Pro       |           | Pro      | Ser  | Asp  | гÀз      |       | мет        |
| 551        |         |           |                |             | 323            |      |        |      |           | 330       |          |      |      |          | 335   |            |
| 552        | Gln     | Glv       | Tvr            | Ala         | Tyr            | Tle  | Leu    | Thr  | His       | Pro       | Glv      | Agn  | Pro  | Cvs      | Tle   | Phe        |
| 553        | <b></b> | 1         | -1-            | 340         | -1-            |      |        |      | 345       |           | 0-1      |      |      | 350      |       |            |
| 554        |         |           |                |             |                |      |        |      | -         |           |          |      |      |          |       | ·          |
| 555        | Tyr     | Asp       | His            | Phe         | Phe            | Asp  | Trp    | Gly  | Leu       | Lys       | Glu      | Glu  | Ile  | Glu      | Arg   | Leu        |
| 556        |         |           | 355            |             |                |      |        | 360  |           |           |          |      | 365  |          |       |            |
| 557        |         | _         |                | _           | _              | _    |        | ~-7  |           |           | _        |      | _    |          | _     | _          |
| 558        | Val     |           | Ile            | Arg         | Asn            | Arg  |        | GТУ  | Ile       | His       | Pro      |      | Ser  | GLu      | Leu   | Arg        |
| 559<br>560 |         | 370       |                |             |                |      | 375    |      |           |           |          | 380  |      |          |       |            |
| 561        | Ile     | Met       | Glu            | Ala         | Asp            | Ser  | Asp    | Leu  | Tvr       | Leu       | Ala      | Glu  | IJe  | Asp      | G] v  | Lvs        |
|            |         |           |                |             |                |      |        |      | - 4 -     |           |          |      |      |          |       | -1-        |

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| 562        | 385         | 39             | 0                  |           | 395              |            | 400         |     |
|------------|-------------|----------------|--------------------|-----------|------------------|------------|-------------|-----|
| 563<br>564 | Val Tle Ti  | nr Lys Ile Gl  | v Pro Ara          | Tur Aco   | Val Clu          | Hig Ton    | Tlo Dwo     |     |
| 565        | var 116 11  | 405            | y FIO AIG          | 410       | vai Giu          | nis neu    | 415         |     |
| 566        |             |                |                    |           |                  |            |             |     |
| 567        | Glu Gly Pl  | ne Gln Val Va  | l Ala His          | Gly Asp   | Gly Tyr          | Ala Ile    | Trp Glu     |     |
| 568        |             | 420            |                    | 425       |                  | 430        |             |     |
| 569        | T Tl.       |                |                    |           |                  |            |             |     |
| 570<br>571 | Lys Ile     |                |                    |           |                  |            |             |     |
| 572        |             |                |                    |           |                  |            |             |     |
| 573        | (2) INFO    | RMATION FOR S  | EO ID NO:          | 7:        |                  |            |             |     |
| 574        | (-,         |                |                    |           |                  |            |             |     |
| 575        | (i)         | SEQUENCE CHA   | RACTERIST          | ICS:      |                  |            |             |     |
| 576        |             | (A) LENGTH:    | 709 base           | pairs     |                  |            |             |     |
| 577        |             | (B) TYPE: r    | ucleic ac:         | id        |                  |            |             |     |
| 578        |             |                | DNESS: sin         | ngle      |                  |            |             |     |
| 579        | •           | (D) TOPOLOG    | Y: linear          |           |                  |            |             |     |
| 580        |             |                |                    |           |                  |            |             |     |
| 581        | (ii)        | MOLECULE TYPE  | E: CDNA to         | o mRNA    |                  |            |             |     |
| 582<br>583 | (222)       | IIVDOMIEM TONT | . 110              |           |                  |            |             |     |
| 584        | (iii)       | HYPOTHETICAL   | : NO               |           |                  |            |             |     |
| 585        | (iv)        | ANTI-SENSE:    | NO                 |           |                  |            |             |     |
| 586        | (= ).       | ANTI DENDE.    | 110                |           |                  |            |             |     |
| 587        | (vi)        | ORIGINAL SOU   | RCE:               |           |                  |            |             |     |
| 588        | , ,         | (A) ORGANIS    | M: Homo sa         | apiens    |                  |            |             |     |
| 589        |             |                |                    | -         |                  |            |             |     |
| 590        | (vii)       | IMMEDIATE SC   | URCE:              |           |                  |            |             |     |
| 591        |             | (B) CLONE:     | alpha-hemo         | oglobin   |                  |            |             |     |
| 592        |             |                |                    |           |                  |            |             |     |
| 593        | (ix)        | FEATURE:       |                    |           |                  |            |             |     |
| 594        | T O GRATTON |                | Y: transit         | t_peptide | e (B)            |            |             |     |
| 595<br>596 | LOCATION:   |                | N. 26 2.           | 4.7       |                  |            |             |     |
| 596<br>597 |             | (B) LOCATIO    | N: 2624            | ± 1       |                  |            |             |     |
| 598        | (ix)        | FEATURE:       |                    |           |                  |            |             |     |
| 599        | ( 111)      | (A) NAME/KE    | Y: CDS             |           |                  |            |             |     |
| 600        |             | · ·            | N: 245             | 570       |                  |            |             |     |
| 601        |             | •              |                    |           |                  |            |             |     |
| 602        | (xi)        | SEQUENCE DES   | CRIPTION:          | SEQ ID 1  | NO: 7:           |            |             |     |
| 603        |             |                |                    |           |                  |            |             |     |
| 604        | CTCGAGGGC   | A TCTGATCTTT   | CAAGAATGG          | C ACAAAT  | FAAC AAC         | ATGGCAC    | AAGGGATACA  | 60  |
| 605        |             |                |                    |           |                  |            |             |     |
| 606        | AACCCTTAA'  | CCCAATTCCA     | ATTTCCATA          | A ACCCCA  | AGTT CCT         | AAATCTT (  | CAAGTTTTCT  | 120 |
| 607<br>608 | <u> </u>    | A TGTAAAAAAC   | ጥር ኋ አ አ አ አ አ ጥጥረ | י אכראאי  | יייירייי איייריי | השקקשיים י | TCDDDDDDDD  | 180 |
| 608        | 191111199   | 1 IGIAAAAAAC   | I GAAAAA I'I'      | - AGCAAA  | LICI AIG         | 1100111    | I GAAAAAAGA | 100 |
| 610        | ТТСААТТТТ   | TATGCAAAAGT    | тттсттсст          | TAGGAT    | TCA GCA          | GGTGGTA    | GAGTTTCTTG  | 240 |
| 611        |             |                |                    |           |                  |            |             |     |
| 612        | CATG GTG    | CTG TCT CCT    | CC GAC AAG         | G ACC AAG | C GTC AA         | G GCC GC   | C TGG GGC   | 289 |
|            |             |                |                    |           |                  |            |             |     |

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| 613 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|-------|---------------|-------|-------|----------|---------|-----|
| 614 |       | Va.   | l Leı | u Sei | r Pro | o Ala | a Asj | р Гу  | 3 Th       | r Ası  | n Val | l Ly:         | s Ala | a Ala | a Try    | o Cly   |     |
| 615 |       | =     | l     |       |       |       | 5     |       |            |        | 10    | 0             |       |       |          | 15      |     |
| 616 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 617 | AAG   | GTT   | GGC   | GCG   | CAC   | GCT   | GGC   | GAG   | TAT        | GGT    | GCG   | GAG           | GCC   | CTG   | GAG      | AGG     | 337 |
| 618 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 619 | Lvs   | Val   | Glv   | Ala   | His   | Ala   | Glv   | Glu   | Tvr        | Glv    | Ala   | Glu           | Ala   | Leu   | Glu      | Arg     |     |
| 620 | -2-   |       | 1     |       | 20    |       | 1     |       | - 2 -      | 25     |       |               |       |       | 30       | 3       |     |
| 621 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 622 | ATG   | ጥጥር   | СТС   | TCC   | TTC   | רככ   | ACC   | אככ   | מממ        | ACC    | ጥልሮ   | יייר <i>י</i> | CCG   | מאמ   | ጥጥር      | GAC     | 385 |
| 623 | 1110  | ++0   | 010   | 100   |       |       | 1100  | 1100  | 1110       | HCC    | inc   | 110           | CCG   | CAC   | 110      | OAC     | 303 |
| 624 | Mat   | Dhe   | T.611 | Car   | Phe   | Dro   | Thr   | Thr   | Larg       | Thr    | Тугу  | Dho           | Dro   | uic   | Dho      | 7 an    |     |
| 625 | Mec   | FILE  | ьеu   | 35    | FIIE  | PIO   | IIII  | 1111  |            | 1111   | ıyı   | PHE           | PIO   |       | Pile     | Asp     |     |
| 626 |       |       |       | 35    |       |       |       |       | 40         |        |       |               |       | 45    |          |         |     |
|     | ama   | 300   | G 7 G | ~~~   | mam   | aaa   | ~~~   | amm   |            | ~~~    | G3.G  | <b>a</b> aa   |       |       | ama      | aaa     | 422 |
| 627 | CTG   | AGC   | CAC   | GGC   | TCT   | GCC   | CAG   | GTT   | AAG        | GGC    | CAC   | GGC           | AAG   | AAG   | GTG      | GCC     | 433 |
| 628 | _     | _     | •     |       | _     |       |       |       | _          |        | •     |               | _     | _     | <b>-</b> |         |     |
| 629 | Leu   | Ser   |       | GIY   | Ser   | Ala   | GIn   |       | Lys        | GIA    | His   | GTĀ           | Lys   | Lys   | Val      | Ala     |     |
| 630 |       |       | 50    |       |       |       |       | 55    |            |        |       |               | 60    |       |          |         |     |
| 631 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 632 | GAC   | GCG   | CTG   | ACC   | AAC   | GCC   | GTG   | GCG   | CAC        | GTG    | GAC   | GAC           | ATG   | CCC   | AAC      | GCG     | 481 |
| 633 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 634 | Asp   | Ala   | Leu   | Thr   | Asn   | Ala   | Val   | Ala   | His        | Val    | Asp   | Asp           | Met   | Pro   | Asn      | Ala     |     |
| 635 |       | 65    |       |       |       |       | 70    |       |            |        |       | 75            |       |       |          |         |     |
| 636 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 637 | CTG   | TCC   | GCC   | CTG   | AGC   | GAC   | CTG   | CAC   | GCG        | CAC    | AAG   | CTT           | CGG   | GTG   | GAC      | CCG     | 529 |
| 638 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 639 | Leu   | Ser   | Ala   | Leu   | Ser   | Asp   | Leu   | His   | Ala        | His    | Lys   | Leu           | Arg   | Val   | Asp      | Pro     |     |
| 640 | 80    |       |       |       |       | 85    |       |       |            |        | 90    |               | _     |       | _        | 95      |     |
| 641 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          | •       |     |
| 642 | GTC   | AAC   | TTC   | AAG   | CTC   | CTA   | AGC   | CAC   | TGC        | CTG    | CTG   | GTG           | ACC   | CTG   | GCC      | GCC     | 577 |
| 643 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 644 | Val   | Asn   | Phe   | Lvs   | Leu   | Leu   | Ser   | His   | Cvs        | Leu    | Leu   | Val           | Thr   | Leu   | Ala      | Ala     |     |
| 645 |       |       |       | -1-   | 100   |       |       |       | -1-        | 105    |       |               |       |       | 110      |         |     |
| 646 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 647 | CAC   | СТС   | כככ   | GCC   | GAG   | ጥጥር   | ACC   | CCT   | GCG        | стс    | CAC   | GCC           | TCC   | CTG   | GAC      | AAG     | 625 |
| 648 | 00    | 010   |       |       | 02.20 |       |       |       | 000        | 0.0    | 00    |               |       | 010   | 00       | 1210    | 023 |
| 649 | His   | T.eu  | Pro   | Δla   | Glu   | Phe   | Thr   | Pro   | Δla        | Val    | His   | Δla           | Ser   | Len   | Δgn      | Lve     |     |
| 650 | ***** |       |       | 115   | مدت   |       |       |       | 120        | V 44 1 |       | 71 <u>1</u> u |       | 125   | 7100     | Lys     |     |
| 651 |       |       |       | 113   |       |       |       |       | 120        |        |       |               |       | 123   |          |         |     |
| 652 | ጥጥር   | СТС   | CCT   | ጥርጥ   | GTG   | 7 CC  | אככ   | СТС   | СТС        | אככ    | TCC   | אאא           | ጥአሮ   | CCT   | ጥአአረ     | GCTGGAG | 677 |
| 653 | 110   | CIG   | GCI   | 101   | GIG   | AGC   | ACC   | GIG   | CIG        | ACC    | 100   |               | IAC   | CGI   | IAA      | CIGGAG  | 0// |
| 654 | Db    | T     | 71 -  | 0     | 17-7  | C     | ml    | 17-7  | T          | ml     | 0     | T             |       | 7     |          |         |     |
|     | Pne   | Leu   |       | ser   | Val   | ser   | IIIL  |       | Leu        | Int    | ser   | гàя           | _     | Arg   |          |         |     |
| 655 |       |       | 130   |       |       |       |       | 135   |            |        |       |               | 140   |       |          |         |     |
| 656 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 657 |       |       |       | ~~==  |       | · ·   |       |       |            |        |       |               |       |       |          |         |     |
| 658 | CCTC  | :GGT/ | AGC ( | JGTT( | CCTC  | JT GO | JCCG( | #TCG? | A CC       |        |       |               |       |       |          |         | 709 |
| 659 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 660 |       |       |       |       |       |       |       |       | _          |        |       |               |       |       |          |         |     |
| 661 | (2)   | INI   | ORM   | ATIO  | 1 FOI | K SE( | ΩI Ç  | NO:8  | <b>ታ</b> : |        |       |               |       |       |          |         |     |
| 662 |       |       |       |       |       |       |       |       |            |        |       |               |       |       |          |         |     |
| 663 | ( )   | L)    | SI    | EQUE  | NCE ( | CHARA | ACTE  | RIST: | ICS:       |        |       |               |       |       |          |         |     |

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| 664        |      |            | t :   | Δ) 1   | r.FNC' | ru.          | 141     | am'             | ino : | aci d | -    |     |      |           |     |     |
|------------|------|------------|-------|--|--------|--------------|---------|-----------------|-------|-------|------|-----|------|-----------|-----|-----|
| 665        | • •  |            |       | (A) LENGTH: 141 amino acids (B) TYPE: amino acid |        |              |         |                 |       |       |      |     |      |           |     |     |
| 666        |      |            |       |  |        | . a.<br>LOGY |         | inea            |       |       |      |     |      |           |     |     |
| 667        |      |            | ١,    |  | IOFO.  | LOGI         |         | IIICa.          | _     |       |      |     |      |           |     |     |
| 668        | ( -  | : \        | 3.00  | MOLECULE TYPE: protein                           |        |              |         |                 |       |       |      |     |      |           |     |     |
|            | (i:  | Ι,         | 1410  | JUEC   | JUE .  | IIPE         | : pr    | ocer            | .1    |       |      |     |      |           |     |     |
| 669        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 670        | , .  |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 671        | (i:  | x)         | Si    | EQUE   | NCE 1  | DESC         | RIPT    | ION:            | SEQ   | ID 1  | 8:ON | :   |      |           |     |     |
| 672        |      | _          | _     | _  |        | _            | _       |                 |       |       |      |     |      |           |     |     |
| 673        |      | Leu        | Ser   | Pro  | Ala    | Asp          | Lys     | Thr             | Asn   |       | Lys  | Ala | Ala  | Trp       | _   | Lys |
| 674        | 1    |            |       |  | 5      |              |         |                 |       | 10    |      |     |      |           | 15  |     |
| 675        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 676        | Val  | Gly        | Ala   | His  | Ala    | Gly          | Glu     | Tyr             | Gly   | Ala   | Glu  | Ala | Leu  | Glu       | Arg | Met |
| 677        |      |            |       | 20   |        |              |         |                 | 25    |       |      |     |      | 30        |     |     |
| 678        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 679        | Phe  | Leu        | Ser   | Phe  | Pro    | Thr          | Thr     | Lys             | Thr   | Tyr   | Phe  | Pro | His  | Phe       | Asp | Leu |
| 680        |      |            | 35    |  |        |              |         | 40              |       |       |      |     | 45   |           |     |     |
| 681        |      |            |       |  |        |              |         |                 | •     |       |      |     |      |           |     |     |
| 682        | Ser  | His        | Gly   | Ser  | Ala    | Gln          | Val     | Lys             | Gly   | His   | Gly  | Lys | Lys  | Val       | Ala | Asp |
| 683        |      | 50         | _     |  |        |              | 55      | _               |       |       |      | 60  | _    |           |     | _   |
| 684        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 685        | Ala  | Leu        | Thr   | Asn  | Ala    | Val          | Ala     | His             | Val   | Asp   | Asp  | Met | Pro  | Asn       | Ala | Leu |
| 686        | 65   |            |       |  |        | 70           |         |                 |       | -     | 75   |     |      |           |     | 80  |
| 687        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 688        | Ser  | Ala        | Leu   | Ser  | asp    | Leu          | His     | Ala             | His   | Lvs   | Leu  | Ara | Val  | Asp       | Pro | Val |
| 689        |      |            |       |  | 85     |              |         |                 |       | 90    |      | 5   |      | · · · · · | 95  |     |
| 690        |      |            |       |  |        |              |         |                 |       | -     |      |     |      |           |     |     |
| 691        | Asn  | Phe        | Lys   | Leu  | Leu    | Ser          | His     | Cvs             | Leu   | Leu   | Val  | Thr | Leu  | Ala       | Ala | His |
| 692        |      |            | -1-   | 100  |        |              |         | -7-             | 105   |       |      |     |      | 110       |     |     |
| 693        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 694        | Len  | Pro        | Ala   | Glu  | Phe    | Thr          | Pro     | Δla             | Val   | His   | Δla  | Ser | T.eu | Asn       | Lvs | Phe |
| 695        |      |            | 115   |  |        |              |         | 120             |       |       |      |     | 125  |           | _,_ |     |
| 696        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 697        | Len  | Δla        | Ser   | Val  | Ser    | Thr          | Val     | Len             | Thr   | Ser   | Taye | Tyr | Δra  |           |     |     |
| 698        | u    | 130        | 001   | Vul  | 501    |              | 135     | u               |       | JCI   | _,   | 140 | 9    |           |     |     |
| 699        |      | 130        |       |  |        |              | 133     |                 |       |       |      | 140 |      |           |     |     |
| 700        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |
| 701        | (2)  | TNE        | ORMA: | гтом   | EOB    | SEO.         | TD I    | ντ <b>Ω</b> . Ω |       |       |      |     |      |           |     |     |
| 701        | (2)  | TIME       | JKIM. | LION   | FOR    | SEQ          | י עד    | NO . 9          | •     |       |      |     |      |           |     |     |
| 702        | 1.   | i)         | CI    | -<br>-   | TOP (  | CHARA        | י מייים | отет.           | TCC.  |       |      |     |      |           |     |     |
| 703        | ١.   | L /        |       |  |        | H: 74        |         |                 |       | -     |      |     |      |           |     |     |
| 704        |      |            |       |  |        | nuc          |         |                 |       | 3     |      |     |      |           |     |     |
| 705<br>706 |      |            |       |  |        | DEDNI        |         |                 |       |       |      |     |      |           |     |     |
|            |      |            |       |  |        |              |         |                 | J.E   |       |      |     |      |           |     |     |
| 707        |      |            | (1    | ר (כ   | )FOT(  | OGY:         | TIN     | =ar             |       |       |      |     |      |           |     |     |
| 708        | / -  | · \        | 3.00  | . T. T. C.                                       |        |              | 173     | .TR 4.          |       |       |      |     |      |           |     |     |
| 709        | (i:  | L)         | M     | JUEC   | . אַער | TYPE         | : CD    | NA C            | מאוו  | AV    |      |     |      |           |     |     |
| 710        | 122  | . <b>.</b> | ***   | ייייטרוז   | TERM T | 77.T .       | NO      |                 |       |       |      |     |      |           |     |     |
| 711        | (ii: | L)         | H.    | I PO I I   | TETT(  | CAL:         | NO      |                 |       |       |      |     |      |           |     |     |
| 712        | 12-  | -1         | 7. 7. |  | יסינתי |              | _       |                 |       |       |      |     |      |           |     |     |
| 713        | (iv  | v )        | Al    | N.T. T = ?                                       | PENSI  | E: NO        | J       |                 |       |       |      |     |      |           |     |     |
| 714        |      |            |       |  |        |              |         |                 |       |       |      |     |      |           |     |     |

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| 715 | (vi)       | ORIGINA     | L SOURCE:           |           |                                 |                 |                 |            |  |  |
|-----|------------|-------------|---------------------|-----------|---------------------------------|-----------------|-----------------|------------|--|--|
| 716 |            |             | GANISM: Homo        | sapiens   |                                 |                 |                 |            |  |  |
| 717 |            | ,,          |                     |           |                                 |                 |                 |            |  |  |
| 718 | (vii)      | IMMEDIA'    | TE SOURCE:          |           |                                 |                 |                 |            |  |  |
| 719 | ( /        |             | ONE: beta-hem       | oglobin   |                                 |                 |                 |            |  |  |
| 720 |            | (2) 02      | one. Deca ne.       | 09102111  |                                 |                 |                 |            |  |  |
| 721 | (ix)       | FEATURE     | •                   |           |                                 |                 |                 |            |  |  |
| 722 | (17)       |             |                     |           | o (D)                           |                 |                 |            |  |  |
|     | T OCATION  | (A) NAI     | ME/KEY: trans       | rr_bebria | е (в)                           |                 |                 |            |  |  |
| 723 | LOCATION   |             | <del>-</del>        | 4 7       |                                 |                 |                 |            |  |  |
| 724 |            | (B) LO      | CATION: 262         | 41        |                                 |                 |                 |            |  |  |
| 725 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 726 | (ix)       | FEATURE     |                     |           |                                 |                 |                 |            |  |  |
| 727 |            |             | ME/KEY: CDS         |           |                                 |                 |                 |            |  |  |
| 728 |            | (B) LO      | CATION: 245         | 685       |                                 |                 |                 |            |  |  |
| 729 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 730 | (xi)       | SEQUENC     | E DESCRIPTION       | : SEQ ID  | NO: 9:                          |                 |                 |            |  |  |
| 731 |            |             |                     | •         |                                 |                 |                 |            |  |  |
| 732 | CTCGAGGG   | GA TCTGAT   | CTTT CAAGAATG       | GC ACAAAT | TAAC AACA                       | ATGGCAC AAGG    | GATACA          | 60         |  |  |
| 733 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 734 | AACCCTTA   | AT CCCAAT   | TCCA ATTTCCAT       | AA ACCCCA | AGTT CCTA                       | AATCTT CAAC     | TTTTCT 1        | 20         |  |  |
| 735 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 736 | TGTTTTTG   | GA TCTAAA   | AAAC TGAAAAAT       | TC AGCAAA | TTCT ATG                        | TGGTTT TGA      | AAAAGA 1        | 80         |  |  |
| 737 |            |             |                     |           |                                 |                 |                 | • •        |  |  |
| 738 | ጥጥሮ ል ልጥጥጥ | רד מדכרממ:  | AAGT TTTGTTCC       | ጥጥ ጥልሮርልጥ | <b>ጥጥሮ</b> ል <mark>ሮ</mark> ሮልር | במייממיים מסמיו | יידידיכיזיזיכ כ | 40         |  |  |
| 739 | IICHMIIII  | II HIOCHE   | AMOI IIIOIICO       | II INOONI | IICH OCH                        | OTOGIA GAGI     | 2               | -0         |  |  |
| 740 | сата ста   | מאכ כידים   | אכייי כיכייי כאכי כ | אם אאם שם | T CCC CTT                       | י אפיי פפפ פיי  | יים יוים כי     | 00         |  |  |
| 741 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 741 | 37-1       | III a Tan I | The Dee Cl. C       | ] T C.    | 31- 17-1                        | mbs No Te       | П               |            |  |  |
|     |            | HIS Leu     | Thr Pro Glu G       | iu ràs se |                                 | I Thr Ala Le    | _               |            |  |  |
| 743 | 1          |             | 5                   |           | 10                              |                 | 15              |            |  |  |
| 744 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 745 | GGC AAG    | GTG AAC G   | TG GAT GAA GT       | T GGT GGT | GAG GCC                         | CTG GGC AGG     | G CTG 3         | 37         |  |  |
| 746 |            | _           |                     |           |                                 |                 |                 |            |  |  |
| 747 | Gly Lys '  |             | al Asp Glu Va       | l Gly Gly | Glu Ala                         | Leu Gly Arg     | J Leu           |            |  |  |
| 748 |            |             | 20                  | 25        |                                 | 30              | )               |            |  |  |
| 749 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 750 | CTG GTG    | TC TAC C    | CT TGG ACC CA       | G AGG TTC | TTT GAG                         | TCC TTT GGG     | GAT 3           | 85         |  |  |
| 751 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 752 | Leu Val '  | Jal Tyr P:  | ro Trp Thr Gl       | n Arg Phe | Phe Glu                         | Ser Phe Gly     | / Asp           |            |  |  |
| 753 |            | 35          |                     | 40        |                                 | 45              |                 |            |  |  |
| 754 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 755 | CTG TCC    | ACT CCT G   | AT GCT GTT AT       | G GGC AAC | CCT AAG                         | GTG AAG GCT     | CAT 4           | 33         |  |  |
| 756 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 757 | Leu Ser '  | Thr Pro A   | sp Ala Val Me       | t Glv Asn | Pro Lvs                         | Val Lvs Ala     | a His           |            |  |  |
| 758 |            | 50          | _                   | 5         | 2-                              | 60              |                 |            |  |  |
| 759 |            |             | _                   | •         |                                 |                 |                 |            |  |  |
| 760 | GGC AAG    | מא מידמ כי  | TG GGT GCC TT       | ጥ አርጥ ርልጥ | CCC CTC                         | מכיד כאלכ כידנ  | 2 GDC 4         | 81         |  |  |
| 761 | JUC AAG A  |             | 10 001 000 11       | I AUI GAI | 330 016                         | COL CAC CIC     |                 | J <u> </u> |  |  |
| 762 | Gly Lye 1  | we Well     | eu Gly Ala Ph       | e Ser Non | Gly Lev                         | Ala Hie Lee     | ı Agn           |            |  |  |
| 762 |            | nyo var D   |                     | е эег нар |                                 | TIG HIS DEL     | rysh            |            |  |  |
|     | 65         |             | 70                  |           | 75                              |                 |                 |            |  |  |
| 764 |            |             |                     |           |                                 |                 |                 |            |  |  |
| 765 | 770 cmc    | 170 000 -   | CC TTT GCC AC       | a ama *a  | 030 0m2                         | CAC MOM CAC     | ם מגר           | 29         |  |  |

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| 766   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
|---|---|----------------------|---|--|--|--|--|--|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|--|-------------------|-----|
|   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 767   | Asn L   | eu Ly                | Gly   | Thr  | Phe  | Ala  | Thr  | Leu  | Ser                      | Glu                      | Leu                      | His                     | Cys                     | Asp  | Lys               |     |
| 768   | 80  |                      |   |  | 85   |  |  |  |                          | 90                       |                          |                         |                         |  | 95                |     |
| 769   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 770   | CTG C   | AC GT                | GAT   | CCT  | GAG  | AGC  | TTC  | AGG  | CTC                      | CTA                      | GGC                      | AAC                     | GTG                     | CTG  | GTC               | 577 |
| 771   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 772   | Leu H   | is Vai               | . Asp   | Pro  | Glu  | Ser  | Phe  | Arg  | Leu                      | Leu                      | Gly                      | Asn                     | Val                     | Leu  | Val               |     |
| 773   |   |                      |   | 100  |  |  |  |  | 105                      |                          |                          |                         |                         | 110  |                   |     |
| 774   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 775   | TGT G   | rg ct                | GCG   | CAT  | CAC  | TTT  | GGC  | AAA  | GAA                      | TTC                      | ACC                      | CCA                     | CCA                     | GTG  | CAG               | 625 |
| 776   |   |                      |   | 1  | •  |  |  | _  |                          |                          |                          | _                       | _                       | <b>_</b>   |                   |     |
| 777   | Cys V   | al Le                |   |  | His  | Phe  | Gly  |  | Glu                      | Phe                      | Thr                      | Pro                     |                         | Val  | Gln               |     |
| 778   |   |                      | 115   |  |  |  |  | 120  |                          |                          |                          |                         | 125                     |  |                   |     |
| 779   | ~~~ ~   |                      |   |  | ~-~  | ~-~  | ~~-  |  |                          |                          |                          |                         |                         |  |                   |     |
| 780   | GCT G   | C TA                 | CAG   | AAA  | GTG  | GTG  | GCT.   | GGT  | GTG                      | GCT                      | AAT                      | GCC                     | CTG                     | GCC  | CAC               | 673 |
| 781   | 73 - 7°                                       | l - M                | . (1)   | T  | 77-7   | 774 T  | 77.  | <b>~1</b>                                      | 77-1                     | 77-                      | 3                        | 77-                     | <b>T</b>                | 31.  | 77.1 -            |     |
| 782   | Ala A   | _                    |   | ьуs  | vaı  | vaı  |  | GIY  | vai                      | Ата                      | Asn                      |                         | ьeu                     | Ата  | HIS               |     |
| 783   |   | 130                  | ,   |  |  |  | 135  |  |                          |                          |                          | 140                     |                         |  |                   |     |
| 784<br>785  | AAG T   | \m                   | י מיח די  | aamaa  |  | ם מיים   | naam/  | 7m (7/   | אאחר                     | nm/mm                    | , mm;                    | N N M C/                | מחחר                    |  |                   | 700 |
| 786   | AAG 1   | AI CA                | , IAA   | GCIC   | 3CI .  | IICI.  | IGCI   | 31 C   | LAAI.                    | LICIA                    | 4 114                    | LAAG(                   | 311C                    |  |                   | 722 |
| 787   | Lys T   | r Hi                 | ,   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 788   |   | 15<br>15             | •   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 789   | _   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 790   | CTTTG'  | rgggg                | TCGA  | GGTC   | A C  |  |  |  |                          |                          |                          |                         |                         |  |                   | 743 |
| 791   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   | ,   |
| 792   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 793   |   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 794   | (2)   |                      |   |  |  |  |  |  |                          |                          |                          |                         |                         |  |                   |     |
|   | \ <b>-</b> /                                  | INFORI               | (ATIO   | N FOI  | SE(  | QI Ç   | NO:  | 10:  |                          |                          |                          |                         |                         |  |                   |     |
| 795   | (2)   | INFORI               | (ATIO   | N FOI  | SE(  | O ID   | NO:  | 10:  |                          |                          |                          |                         |                         |  |                   |     |
| 796   | (i)   |                      | (ATIO   |  |  | -  |  |  |                          |                          |                          |                         |                         |  |                   |     |
| 796<br>797  |   |                      | SEQUE   | NCE (  | CHARA  | ACTEI<br>16 ar   | RIST:  | ICS:   | ls                       |                          |                          |                         |                         |  |                   |     |
| 796<br>797<br>798   |   | \$                   | SEQUE<br>(A) L  | NCE (<br>ENGTI<br>TYPE   | CHARA<br>H: 14   | ACTEI<br>16 ar<br>ino a  | RIST:<br>mino<br>acid                              | ICS:   | ls                       |                          |                          |                         |                         |  |                   |     |
| 796<br>797<br>798<br>799  | (i)   | \$                   | SEQUE<br>(A) L<br>(B) '   | NCE (<br>ENGTI<br>TYPE<br>TOPOI  | CHARA<br>H: 14<br>: am:<br>LOGY  | ACTEI<br>16 ar<br>ino a  | RIST:<br>mino<br>acid<br>near                      | ICS:<br>acid                                   | ls                       |                          |                          |                         |                         |  |                   |     |
| 796<br>797<br>798<br>799<br>800   |   | \$                   | SEQUE<br>(A) L  | NCE (<br>ENGTI<br>TYPE<br>TOPOI  | CHARA<br>H: 14<br>: am:<br>LOGY  | ACTEI<br>16 ar<br>ino a  | RIST:<br>mino<br>acid<br>near                      | ICS:<br>acid                                   | ls                       |                          |                          |                         |                         |  |                   |     |
| 796<br>797<br>798<br>799<br>800<br>801  | (i)<br>(ii)                                   |                      | SEQUE<br>(A) L:<br>(B) '<br>(D) '   | NCE (<br>ENGTI<br>TYPE<br>TOPOI<br>ULE '   | CHARI<br>H: 14<br>: am:<br>LOGY<br>TYPE  | ACTEI<br>16 ar<br>ino a<br>: lir<br>: pro                        | RIST<br>mino<br>acid<br>near<br>otei               | ICS:<br>acio                                   |                          | <b>TO</b>                |                          |                         |                         |  |                   |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802   | (i)   |                      | SEQUE<br>(A) L<br>(B) '   | NCE (<br>ENGTI<br>TYPE<br>TOPOI<br>ULE '   | CHARI<br>H: 14<br>: am:<br>LOGY<br>TYPE  | ACTEI<br>16 ar<br>ino a<br>: lir<br>: pro                        | RIST<br>mino<br>acid<br>near<br>otei               | ICS:<br>acio                                   |                          | <b>NO:</b> 1             | LO:                      |                         |                         |  |                   |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803  | (i)<br>(ii)<br>(xi)                           | :<br>:               | SEQUE<br>(A) L:<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE  | NCE CENGTHE TYPE TOPOLULE TOPO | CHARI H: 14 : am: LOGY TYPE DESCI  | ACTEI<br>16 ar<br>ino a<br>: lir<br>: pro                        | RIST:<br>mino<br>acid<br>near<br>otein             | ICS:<br>acid                                   | ID 1                     |                          |                          | חות                     | Lou                     | The same of the sa | Clar              |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804   | (ii) (ii) (xi) Val H                          | :<br>:               | SEQUE<br>(A) L:<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE  | NCE (ENGTI<br>TYPE<br>TOPOI<br>ULE T   | CHARI H: 14 : am: LOGY TYPE DESCI  | ACTEI<br>16 ar<br>ino a<br>: lir<br>: pro                        | RIST:<br>mino<br>acid<br>near<br>otein             | ICS:<br>acid                                   | ID 1                     |                          |                          | Ala                     | Leu                     | -  | Gly               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805  | (i)<br>(ii)<br>(xi)                           | :<br>:               | SEQUE<br>(A) L:<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE  | NCE CENGTHE TYPE TOPOLULE TOPO | CHARI H: 14 : am: LOGY TYPE DESCI  | ACTEI<br>16 ar<br>ino a<br>: lir<br>: pro                        | RIST:<br>mino<br>acid<br>near<br>otein             | ICS:<br>acid                                   | ID 1                     |                          |                          | Ala                     | Leu                     | Trp<br>15  | Gly               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805  | (ii) (ii) (xi) Val H                          | !<br>!<br>is Let     | SEQUE<br>(A) L<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE   | NCE (ENGTHER PROPERTIES OF THE | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCH   | ACTER<br>16 ar<br>ino a<br>: lir<br>: pro<br>RIPT:               | RIST:<br>mino<br>acid<br>near<br>otein<br>ION:     | ICS:<br>acid<br>seq<br>ser                     | ID 1<br>Ala<br>10        | Val                      | Thr                      |                         |                         | 15   | -                 |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806   | (ii) (ii) (xi) Val H                          | !<br>!<br>is Let     | SEQUE<br>(A) L<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE<br>1 Thr                                | NCE (ENGTHER PROPERTIES OF THE | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCH   | ACTER<br>16 ar<br>ino a<br>: lir<br>: pro<br>RIPT:               | RIST:<br>mino<br>acid<br>near<br>otein<br>ION:     | ICS:<br>acid<br>seq<br>Ser                     | ID 1<br>Ala<br>10        | Val                      | Thr                      |                         | Arg                     | 15   | -                 |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807                                    | (ii) (ii) (xi) Val H                          | !<br>!<br>is Let     | SEQUE<br>(A) L<br>(B) '<br>(D) '<br>MOLEC'<br>SEQUE   | NCE (ENGTHER PROPERTIES OF THE | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCH   | ACTER<br>16 ar<br>ino a<br>: lir<br>: pro<br>RIPT:               | RIST:<br>mino<br>acid<br>near<br>otein<br>ION:     | ICS:<br>acid<br>seq<br>ser                     | ID 1<br>Ala<br>10        | Val                      | Thr                      |                         |                         | 15   | -                 |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808                             | (ii) (ii) (xi) Val H                          | !<br>is Let          | SEQUE<br>(A) L:<br>(B) '(D) '(OLEC'<br>SEQUE<br>1 Thr<br>1 Val                              | NCE ( ENGTI TYPE TOPOI ULE ' NCE I Pro 5   | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCI<br>Glu  | ACTEI<br>16 an<br>ino a<br>: lin<br>: pro<br>RIPT:<br>Glu<br>Val | RIST: mino acid near otein ION: Lys                | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25        | ID 1<br>Ala<br>10<br>Glu | Val<br>Ala               | Thr<br>Leu               | Gly                     | Arg<br>30               | 15<br>Leu  | Leu               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808<br>809                      | (ii) (ii) (xi) Val H                          | is Len               | SEQUE<br>(A) L<br>(B) '<br>(O) '<br>MOLEC'<br>SEQUE<br>1 Thr<br>1 Val<br>20                 | NCE ( ENGTI TYPE TOPOI ULE ' NCE I Pro 5   | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCI<br>Glu  | ACTEI<br>16 an<br>ino a<br>: lin<br>: pro<br>RIPT:<br>Glu<br>Val | RIST: mino acid hear otein ION: Lys Gly Arg        | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25        | ID 1<br>Ala<br>10<br>Glu | Val<br>Ala               | Thr<br>Leu               | Gly<br>Phe              | Arg<br>30               | 15<br>Leu  | Leu               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808<br>810<br>811               | (ii) (ii) (xi) Val H                          | !<br>is Let          | SEQUE<br>(A) L<br>(B) '<br>(O) '<br>MOLEC'<br>SEQUE<br>1 Thr<br>1 Val<br>20                 | NCE ( ENGTI TYPE TOPOI ULE ' NCE I Pro 5   | CHARA<br>H: 14: am:<br>LOGY<br>TYPE<br>DESCI<br>Glu  | ACTEI<br>16 an<br>ino a<br>: lin<br>: pro<br>RIPT:<br>Glu<br>Val | RIST: mino acid near otein ION: Lys                | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25        | ID 1<br>Ala<br>10<br>Glu | Val<br>Ala               | Thr<br>Leu               | Gly                     | Arg<br>30               | 15<br>Leu  | Leu               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808<br>809                      | (ii) (xi) (xi) Val H 1 Lys Va                 | is Lenal Asial Tyr   | SEQUE<br>(A) L.<br>(B) '<br>(O) '<br>MOLEC'<br>SEQUE<br>1 Thr<br>1 Val<br>20                | NCE ( ENGTI TYPE TOPOI ULE 7 NCE I Pro 5 Asp   | CHARAMENT OF THE CHARAM | ACTEI<br>16 an<br>ino a<br>: lin<br>: pro<br>RIPT:<br>Glu<br>Val | RIST: mino acid hear otein ION: Lys Gly Arg 40     | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25<br>Phe | ID MAla 10 Glu           | Val<br>Ala<br>Glu        | Thr<br>Leu<br>Ser        | Gly<br>Phe<br>45        | Arg<br>30<br>Gly        | 15<br>Leu<br>Asp   | Leu               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808<br>809<br>810<br>811        | (ii) (xi) (xi) Val H 1 Lys Val Val Val Ser Ti | is Lenal Asial Tyr   | SEQUE<br>(A) L.<br>(B) '<br>(O) '<br>MOLEC'<br>SEQUE<br>1 Thr<br>1 Val<br>20                | NCE ( ENGTI TYPE TOPOI ULE 7 NCE I Pro 5 Asp   | CHARAMENT OF THE CHARAM | ACTEI<br>16 an<br>ino a<br>: lin<br>: pro<br>RIPT:<br>Glu<br>Val | RIST: mino acid hear otein ION: Lys Gly Arg 40     | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25<br>Phe | ID MAla 10 Glu           | Val<br>Ala<br>Glu        | Thr<br>Leu<br>Ser        | Gly<br>Phe<br>45        | Arg<br>30<br>Gly        | 15<br>Leu<br>Asp   | Leu               |     |
| 796<br>797<br>798<br>799<br>800<br>801<br>802<br>803<br>804<br>805<br>806<br>807<br>808<br>810<br>811<br>812<br>813 | (ii) (xi) (xi) Val H 1 Lys Val Val Val Ser Ti | is Len  Asi  Tyr  3! | SEQUE<br>(A) L.<br>(B) '<br>(O) '<br>MOLEC'<br>SEQUE<br>1 Thr<br>1 Val<br>20<br>20<br>3 Pro | NCE ( ENGTI TYPE TOPOI ULE ' NCE I Pro 5 Asp Trp Ala   | CHARAME I 14: 14: 14: 14: 14: 14: 14: 14: 14: 14:  | ACTEN<br>16 and and an       | RIST: mino acid hear otein ION: Lys Gly Arg 40 Gly | ICS:<br>acid<br>SEQ<br>Ser<br>Gly<br>25<br>Phe | ID MAla 10 Glu Phe       | Val<br>Ala<br>Glu<br>Lys | Thr<br>Leu<br>Ser<br>Val | Gly<br>Phe<br>45<br>Lys | Arg<br>30<br>Gly<br>Ala | 15<br>Leu<br>Asp<br>His  | Leu<br>Leu<br>Gly |     |

# RAW SEQUENCE LISTING PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:29:30

| 817<br>818               | 65               | 70  |                             | 75                     | 80                 |  |  |  |  |  |  |  |
|--------------------------|------------------|---|-----------------------------|------------------------|--------------------|--|--|--|--|--|--|--|
| 819<br>820<br>821        | Leu Lys          | Gly Thr Phe Ala 3   | Thr Leu Ser (               | Glu Leu His Cys<br>90  | Asp Lys Leu<br>95  |  |  |  |  |  |  |  |
| 822<br>823<br>824        | His Val          | Asp Pro Glu Ser I   | Phe Arg Leu I<br>105        | Leu Gly Asn Val        | Leu Val Cys<br>110 |  |  |  |  |  |  |  |
| 825<br>826<br>827        | Val Leu          | Ala His His Phe (   | Gly Lys Glu I<br>120        | Phe Thr Pro Pro<br>125 | Val Gln Ala        |  |  |  |  |  |  |  |
| 828<br>829<br>830        | Ala Tyr<br>130   | Gln Lys Val Val I   | Ala Gly Val <i>F</i><br>135 | Ala Asn Ala Leu<br>140 | Ala His Lys        |  |  |  |  |  |  |  |
| 831<br>832<br>833        | Tyr His<br>145   |   |                             |                        |                    |  |  |  |  |  |  |  |
| 834<br>835<br>836        | (2) IN           | FORMATION FOR SEQ   | ID NO:11:                   |                        |                    |  |  |  |  |  |  |  |
| 837<br>838               | (i)              |   | 7 amino acids               | 5                      |                    |  |  |  |  |  |  |  |
| 839<br>840<br>841        |                  | (B) TYPE: amin<br>(D) TOPOLOGY:   |                             |                        |                    |  |  |  |  |  |  |  |
| 842<br>843               | (ii)             | MOLECULE TYPE:  | peptide                     |                        |                    |  |  |  |  |  |  |  |
| 844<br>845               | (v)              | FRAGMENT TYPE:  | N-terminal                  |                        |                    |  |  |  |  |  |  |  |
| 846<br>847<br>848<br>849 | (vi)             | ORIGINAL SOURCE:<br>(A) ORGANISM: alkalophilic Bacillus sp.<br>(B) STRAIN: 38-2 |                             |                        |                    |  |  |  |  |  |  |  |
| 850<br>851<br>852        | <pre>(vii)</pre> |   |                             |                        |                    |  |  |  |  |  |  |  |
| 853<br>854               | (xi)             | SEQUENCE DESCRI   | IPTION: SEQ I               | ID NO: 11:             |                    |  |  |  |  |  |  |  |
| 855<br>856<br>857        | Ala Pro<br>1     | Asp Thr Ser Val S   | _                           | Gln Asn Phe Ser<br>10  | Thr Asp Val<br>15  |  |  |  |  |  |  |  |
| 858<br>859               | Ile              |   |                             |                        |                    |  |  |  |  |  |  |  |

# SEQUENCE VERIFICATION REPORT PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:29:36

INPUT SET: S818.raw

Line

Error

Original Text

31

Wrong application Serial Number

(A) APPLICATION NUMBER: US 923,692

### SEQUENCE MISSING ITEM REPORT PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:29:36

INPUT SET: S818.raw

COUNTRY
PRIOR APPLICATION DATA More Identifiers Found Than MAX Allowed

# SEQUENCE CORRECTION REPORT PATENT APPLICATION US/07/923,692C

DATE: 10/28/93 TIME: 16:29:37

INPUT SET: S818.raw

Line

Original Text

Corrected Text